INSECTS OF MICRONESIA

Coleoptera: Platypodidae and Scolytidae[1]

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INTRODUCTION

This report is based upon collections from the Bonin Islands, the Volcano Islands, the Mariana Islands, the principal high islands and a few atolls of the Caroline Islands, and several of the atolls of the Marshall Islands. Material from Ocean, Nauru, Marcus, and Wake Islands was not available.

The specimens were primarily collected by H. S. Dybas, J. L. Gressitt, J. F. G. Clarke, J. W. Beardsley, H. K. Townes, and R. G. Oakley. Smaller numbers of specimens were taken by G. E. Bohart, R. M. Bohart, T. Esaki, E. Hagen, R. J. Goss, K. L. Maehler, P. A. Adams, N. L. H. Krauss, I. La Rivers, J. R. Stuntz, R. L. Usinger, W. L. Necker, K. Yasumatsu, S. Yoshimura, R. W. L. Potts, D. B. Langford, Y. Kondo, S. Edgar, H. S. Ducoff, D. Matusita, A. R. Mead, H. G. Hornbostel, Z. Ono, and S. Uchiyama. Much of the material reported by Schedl (1942, B. P. Bishop Mus., Bull. **172**: 147-149) was also examined.

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Appreciation is also expressed to the United States National Museum for making the collections there available for study and for providing facilities to study material in the Eggers collection and to the Trust Territory of the Pacific Islands, Chicago Natural History Museum, California Academy of Sciences, Museum of Comparative Zoölogy, Bernice P. Bishop Museum, United States

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Plant Quarantine at Pearl Harbor, Kyushu University, and the Hawaiian Sugar Planters' Association for material examined from their collections.

The following symbols indicate the institutions in which specimens are stored: US (United States National Museum), BISHOP (Bernice P. Bishop Museum), CM (Chicago Natural History Museum), CNC (Canadian National Collection), MCZ (Museum of Comparative Zoölogy), and CAS (California Academy of Sciences).

ZOOGEOGRAPHY

One hundred and twenty-three specimens of Platypodidae were examined from Micronesia and found to represent five species and two genera. Among more than 2,800 specimens of Scolytidae examined, 53 species, belonging to 16 genera, were represented. Because of their secretive habits, representatives of these families are encountered accidentally by most collectors. Of the total of 58 species of both families, the majority were taken, at least in part, at light. Attraction to light is relatively common in *Platypus* and *Xyleborus,* but rather uncommon in most other Micronesian genera; it is presumed, therefore, that only a fraction of the scolytoid species in the area are included in this report. According to data on the labels, four of the five species of Platypodidae, nine of the 17 of *Xyleborus,* and eight of the remaining 36 of Scolytidae were taken exclusively at light.

Within Micronesia these families are best represented in Palau, where 33 of the 58 species occurred. Of the 25 species not collected in Palau, at least seven are essentially cosmopolitan economic species that were either overlooked by collectors or will soon occur there. Of the remaining 18 species, 13 were taken on only one island and, for the most part, were represented by so few specimens that the record of their occurrence may have resulted from the accidental collection of species not actually established on the islands.

Of the 58 Micronesian species, 35 were previously known from New Guinea to the Philippine Islands and westward; of the remaining 23 species, 15 are described as new in this report, six were known from other Pacific islands between the Fijian and Hawaiian Islands, one was known from North America, and one was known only from Guam.

Records of the scolytoid fauna of other Pacific island groups show that 18 of the 58 Samoan species [Schedl, 1951, B. P. Bishop Mus., Occ. Papers **20** (10): 131-156], eight of the 43 Fijian species [Schedl, 1950, op. cit., **20**(3): 35-54], and nine of the 20 Mangarevan species [Beeson, 1940, B. P. Bishop Mus., Occ. Papers **15** (18): 191-203] also occur in Micronesia. The differences in species composition between these areas appear to be exaggerated somewhat by the inclusion of synonyms of Micronesian species; clarification of this must await an examination of type material.

Because of their secretive habits, these beetles are particularly well adapted, especially the ambrosia beetles (*Xyleborus, Diapus,* and *Platypus*), to trans-

portation through commerce to all parts of the world. This is evidenced by the fact that 19 of the 58 species occur at least a third of the way around the world in tropical areas; 12 of these 19 species are ambrosia beetles. Polyphagous twig-boring species, such as *Hypothenemus areccae, H. eruditus,* and *Stephanoderes georgiae,* which reproduce in straw or apparently almost any other plant material, also have very wide distributions. Of the 24 non-cosmopolitan Micronesian species previously reported in the literature, nine occur from New Guinea to the Philippine Islands and westward, six occur in the Pacific area between the Fijian and Hawaiian Islands, seven occur in both of these areas, one occurs in Japan, and one is endemic to Micronesia. The 15 species described as new from Micronesia (including Murayama's *Platypus acutidentatus*) are ignored in this analysis because their distributions are not yet fully known.

The family Platypodidae is represented by five species: one in the Diapodini (*Diapus*) and four in the Platypini (*Platypus*). Four of these five species are also known to occur from New Guinea to the Philippine Islands. In the absence of an adequate generic classification of the Scolytidae, representatives of the family are grouped tentatively, for the purposes of this study, into the following tribes: two in the Hylesinini (*Hylesinus* and *Phloeosinus*), one in the Hypoborini (*Phloeotrypetus*), one in the Xyloctonini (*Scolytomimus*), 24 in the Cryphalini (*Ptilopodius* to *Hypothenemus*), seven in the Dryocoetini (*Carposinus* to *Poecilips*), and 18 in the Xyleborini (*Xyleborus*). Of these, one Hylesinini, eight Cryphalini, six Dryocoetini, and 16 Xyleborini were previously known from New Guinea to the Philippine Islands. One of the Hylesinini, nine of the Cryphalini, four of the Dryocoetini, and 13 of the Xyleborini have been reported from the Pacific area between the Fijian and Hawaiian Islands.

The group most conspicuous by its absence from Micronesia is the large platypodid genus *Crossotarsus*. One might also expect a better representation of the Hylesinini, Dryocoetini, and Xyleborini, particularly by species from genera not included in this report. On the other hand, it is somewhat surprising to find six species of *Cryphalomorphus* from an area where not more than two or three might be expected.

SYSTEMATICS

Family PLATYPODIDAE

Key to Micronesian Genera of Platypodidae

1. Anterior coxae widely separated; posterior tibia with outer apical margin broadly produced beyond inner apical margin; abdominal segments 1 to 4 horizontal, 5 vertical and usually concave with subcircular outline.............**Diapus**

   Anterior coxae contiguous; posterior tibia with outer apical angle produced or not, but not exceeding inner apical angle...**Platypus**

Distribution of Micronesian Platypodidae and Scolytidae

	Micronesian Island Groups												
					Caroline								
	Bonin	Volcano	N. Mariana	S. Mariana	Palau	Yap	Caroline Atolls	Truk	Ponape	Kusaie	Marshall	Gilbert	Other Localities
Platypodidae													
1. Diapus pusillimus									×				South Asia to Australia, Africa, Samoan Is.
2. Platypus externedentatus					×								Hawaiian, Society, Fijian, Samoan Is.; Formosa
3. P. solidus				×	×								Southeast Asia to Australia
4. P. acutidentatus					×								
5. P. jansoni					×	×				×			Celebes to New Guinea
Scolytidae													
6. Hylesinus subcostatus				×	×		×	×	×		×	×	Sumatra; Samoan, Fijian, Society Is.
7. Phloeosinus pacificus*					×								
8. Phloeotrypetus palauensis*					×								
9. Scolytomimus bicolor*					×								
10. Ptilopodius dubiosus*					×								
11. P. pacificus				×						×	×		Hawaiian Is.
12. P. ramosus					×	×		×	×				India, Mangareva, Society Is.
13. Erioschidias frontalis*					×			×					
14. Ericryphalus sylvicola			×	×	×								Hawaiian, Samoan, Fijian Is.
15. E. longipilus					×								Philippine Is.
16. E. minimus					×	×							Philippine Is.
17. Hypocryphalus mangiferae					×								Circumtropical
18. Cryphalomorphus pacificus				×	×	×		×					
19. C. pumilus*				×									
20. C. nanulus*													
21. C. basilaris*					×								
22. C. nubilus*										×	×		
23. C. granulatus*				×									
24. Eidophelus incomptus*		×											
25. E. argutus*				×									
26. E. atomus*						×							
27. Stephanoderes birmanus				×	×	×		×	×	×			Southeast Asia, North America, Africa
28. S. hampei				×					×				Circumtropical
29. S. hivaoea	×			×									Hawaiian Is., Marquesas
30. S. georgiae				×									North America
31. Hypothenemus areccae				×					×		×		South Asia, Hawaiian Is.
32. H. eruditus	×	×		×	×	×	×	×	×	×	×		Circumtropical
33. H. mangarevanus				×									Mangareva

Distribution of Micronesian Platypodidae and Scolytidae (Continued)

	Micronesian Island Groups												
					Caroline								
	Bonin	Volcano	N. Mariana	S. Mariana	Palau	Yap	Caroline Atolls	Truk	Ponape	Kusaie	Marshall	Gilbert	Other Localities
34. Carposinus brevior				×		×		×	×	×	×		Philippine, Samoan Is.
35. Coccotrypes carpophagus				×		×							Southeast Asia-Australia, Hawaiian Is.
36. Poecilips striatus					×								Philippine, Solomon Is.
37. P. variabilis						×			×				Southeast Asia
38. P. persicae					×			×					Hawaiian Is., Cuba
39. P. fallax											×		Southeast Asia, Java
40. P. vulgaris					×				×				Southeast Asia; Philippine, Samoan Is.
41. Xyleborus morigerus				×				×	×				Ceylon to New Guinea; Philippine, Samoan Is.
42. X. bidentatus					×					×			Southeast Asia, Philippine Is., Africa
43. X. versicolor									×				Malaya
44. X. fornicatus	×				×	×			×				India to Australia, Hawaiian Is.
45. X. semigranosus					×								Southeast Asia; Philippine, Samoan, Hawaiian Is.; Africa
46. X. senachalensis									×				India
47. X. destruens					×								Andaman to Samoan Is.
48. X. exiguus					×			×	×	×			Southeast Asia to New Guinea; Philippine, Fijian Is.
49. X. agnatus					×				×				Southeast Asia to New Guinea
50. X. indicus								×	×				Africa, South Asia to Australia; Philippine, Samoan Is.
51. X. laevis									×	×			Southeast Asia to New Guinea, Philippine Is.
52. X. kororensis*					×								
53. X. ferrugineus				×	×			×	×	×		×	Circumtropical
54. X. similis				×	×		×	×	×	×	×		Southeast Asia to Australia; Philippine, Hawaiian, Samoan Is.
55. X. buxtoni					×					×			Samoan Is.
56. X. volvulus					×			×					Circumtropical
57. X. perforans	×			×	×	×	×	×	×	×	×		Circumtropical
58. X. affinis					×	×		×	×	×			Circumtropical

* Described as new.

Genus **Diapus** Chapuis

Diapus Chapuis, 1865, Monographie Platypides, 43, 329.—Strohmeyer, 1912, Coleopt. Cat. **44**: 22; 1914, Genera Insectorum **163**: 46.—Hopkins, 1914, U. S. Nat. Mus., Proc. **48**: 121 (type: *D. quadrispinatus* Chapuis).—Schedl, 1939, VII Int. Kongr. Ent., Verh. **1**: 404.

This genus appears to have been originally oriental in distribution. In more recent years, the distributions of some species have extended into Africa, Madagascar, Australia, and the Samoan Islands.

1. **Diapus pusillimus** Chapuis.

Diapus pusillimus Chapuis, 1865, Monographie Platypides, 335, fig. 202.—Schedl, 1951, B. P. Bishop Mus., Occ. Papers **20** (10): 142.

Crossotarsus grevilleae Lea, 1914, Roy. Soc. Victoria, Proc. **26**: 226.

Female: Length about 2.0-2.5 mm.; body light brown; head, pronotal disc anterior to transverse cavities, and declivital area of elytra darker.

Frons flattened, transversely impressed above epistomal margin; narrowly elevated median carina visible at center and in transversely impressed area; surface reticulate, indistinctly, sparsely punctured. Each mandible bears a large sickle-shaped structure about 1.5 times as long as antennal scape (one or both of these structures often missing in older specimens).

Pronotum 1.4 times as long as wide; sides strongly constricted on anterior two-thirds, widest one-third of distance from base; surface smooth, shining, impunctate, except reticulate at anterior margin; darkened portion of median line visible on basal half; pair of narrow, hair-lined, transverse cavities near base extending from median line three-fourths of distance to lateral margin.

Elytra about twice as long as wide; striae indefinite, punctures rather obscure. Declivity abrupt, short; suture strongly and abruptly impressed. Visible abdominal sternum 5 planoconcave, margin bearing row of long setae, some of those on apical margin much longer.

Male: Similar to female except mandibles unarmed; transverse cavities at base of pronotum shorter; basal margins of elytra sharply raised; striae 1 and 2 narrowly, not deeply impressed; declivital margin acute, sutural sulcus deeper and more abrupt; a large, low tubercle near center of declivital face on each elytron; and anterior and posterior margins of visible abdominal sternum 5 acutely raised.

DISTRIBUTION: Indo-Malayan Region to New Guinea and Australia, Africa, Madagascar, Samoan and eastern Caroline Is.

PONAPE. One, Mt. Temwetemwensekir, 180 m., light trap, Jan. 19, 1953, Gressitt.

Genus **Platypus** Herbst

Platypus Herbst, 1793, IN Jablonsky, Natursyst. Ins., Käfer **5**: 128 (type: *Bostrichus cylindrus* Fabricius).—Chapuis, 1865, Monographie Platypides, 26, 97.—Strohmeyer, 1912, Coleopt. Cat. **44**: 7; 1914, Genera Insectorum **163**: 20.—Schedl, 1939, VII Int. Kongr. Ent., Verh. **1**: 397.

As treated by current authors, this genus might be considered cosmopolitan. However, it appears to represent a composite group that cannot be adequately separated from the apparently composite genus *Crossotarsus*. A thorough systematic treatment of all known species of both genera is sorely needed.

Key to Micronesian Species of Platypus

1. Elytral bases smooth and rounded; striae not impressed, punctures minute and rather widely separated; female pronotum without patch of large pores on posterior half; declivity of male elytra not steep, appearing truncate from above, with lateral angles produced........2. **externedentatus**

   Elytral bases transversely carinate and often also retuse; striae narrowly impressed, punctures close, often obscured by confluence; female pronotum with definite median patch of large pores on posterior half; male elytra variously sculptured 2
2. Male elytra posteriorly attenuate; posterior half of female pronotum with about four to seven large, and behind these several small, pores on each side of anterior end of darkened portion of median line........3. **solidus**

   Male elytra posteriorly broadly rounded or truncate; posterior half of female pronotum with bioval patch of numerous large pores of uniform size distributed along entire length of darkened portion of median line........ 3
3. Male declivity subvertical, concave, with margin sharply elevated, sutural apex deeply emarginate, emargination armed by pair of posteriorly directed teeth; upper half of female frons rather deeply concave; smaller, length 4.6 mm. or less, rather slender........4. **acutidentatus**

   Larger, 5.2 mm. or more, stouter; male declivity convex, margin not sharply elevated, with large tubercle at junction of interspaces 3 and 5; female frons impressed, but not deeply concave above........5. **jansoni**

2. **Platypus externedentatus** Fairmaire (fig. 1).

Platypus externedentatus Fairmaire, 1850, Rev. Mag. Zool. II, **2**: 51.—Schedl, 1941, Hawaiian Ent. Soc., Proc. **11** (1): 116; 1950, B. P. Bishop Mus., Occ. Papers **20** (3): 41; 1951, B. P. Bishop Mus., Occ. Papers **20** (10): 141.

Crossotarsus externedentatus, Chapuis, 1865, Monographie Platypides, 81, fig. 20.—Beeson, 1929, Insects of Samoa **4** (4): 218; 1935, B. P. Bishop Mus., Bull. **142: 115**; 1938, Federated Malay States Mus., Jour. **18**: 295; 1940, B. P. Bishop Mus., Occ. Papers **15** (18): 191.—Schedl, 1941 (1940), Rev. Franç. Ent. **7**: 153.—Swezey, 1941, Hawaiian Ent. Soc., Proc. **11** (1): 124.

Male: Length about 4 mm.; body rather dark brown.

Frons planoconvex, feebly impressed from epistomal margin to level of antennal insertion; surface reticulate and deeply, rather coarsely, substrigosely punctured above, more finely, regularly punctured in impressed area; a fine median carina extending from level of antennal insertion to upper level of eyes (often visible only at upper and lower ends).

Pronotum indistinctly longer than wide (1.02 times); sides moderately constricted on posterior half, narrowest point about two-fifths of distance from base; surface minutely substrigose-reticulate, and minutely, sparsely punctured; darkened portion of median line visible on basal one-third.

Elytra 1.8 times as long as wide; posteriorly truncate with lateral angles extending

into moderately large, pointed processes; surface minutely substrigose-reticulate at base, becoming microscopically punctate on posterior two-thirds; strial punctures minute, rather irregular. Declivity gradual, except subvertical toward apex; striae sulcate from declivital base, sulci increasing in depth and width with consequent reduction in width and height of interstriae; upper margin of vertical portion armed by tubercles on interspaces 1 (larger) and 3, a few smaller ones in more lateral areas; apical margin with a moderately large serration in line with interspace 3; declivital interstriae bearing rows of rather long, blunt bristles.

Female: Similar to male except slightly larger; surface of elytra subreticulate to declivity; declivital striae not impressed, interstriae not armed and lateral angles not produced; declivital vestiture hairlike.

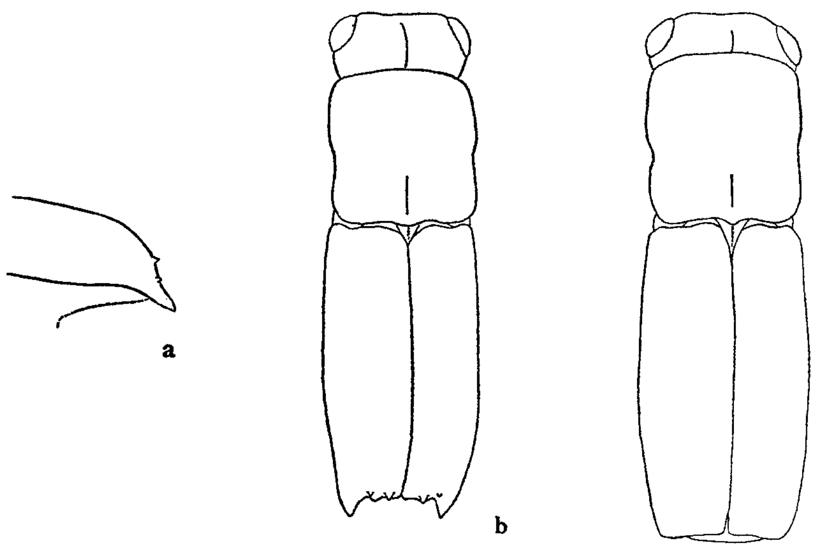


FIGURE 1.—*Platypus externedentatus:* **a**, lateral view; male declivity; **b**, dorsal view, male; **c**, dorsal view, female.

DISTRIBUTION: Madagascar, Formosa, Hawaiian, Fijian, Samoan, Society, and western Caroline Is.

PALAU. KOROR: One, at light, Apr. 1953, Beardsley; one, limestone ridge south of inlet, Jan. 1948, Dybas. PELELIU: Three, at light, July 1945, Dybas.

3. **Platypus solidus** Walker (fig. 2).

Platypus solidus Walker, 1858, Ann. Mag. Nat. Hist. III, **2**:286.—Chapuis, 1865, Monographie Platypides, 267, fig. 160.—Beeson, 1921, Indian Forester, 24.—Schedl, 1942, B. P. Bishop Mus., Bull. **172**: 147; 1955, Mus. G. Frey, Ent. Arb. **6**: 283.

Platypus pilifrons Chapuis, 1865, Monographie Platypides, 265, fig. 159.

Male: Length 4 mm.; color brown.

Frons shallowly concave from vertex to epistoma; surface coarsely, closely granulate, somewhat finer below.

Pronotum 1.1 times as long as wide; sides moderately constricted on middle third, narrowest point at center; surface moderately coarsely, rather closely punctured, intervening spaces minutely, transversely substrigose-reticulate, except partly reduced to minute punctures on posterior half; darkened portion of median line visible on slightly more than basal third.

Elytra 2.3 times as long as wide; sides straight, but serrate on anterior half, attenuate behind; basal margins finely, sharply raised; striae weakly impressed, 1 more strongly impressed than others, punctures small, very close, more or less confluent toward declivity; interstriae about three times as wide as striae, almost flat, punctures slightly smaller than those of striae, separated by a distance about equal to their own diameters, uniseriate behind, becoming confused and larger toward base. Declivity gradual, sides tapering to a

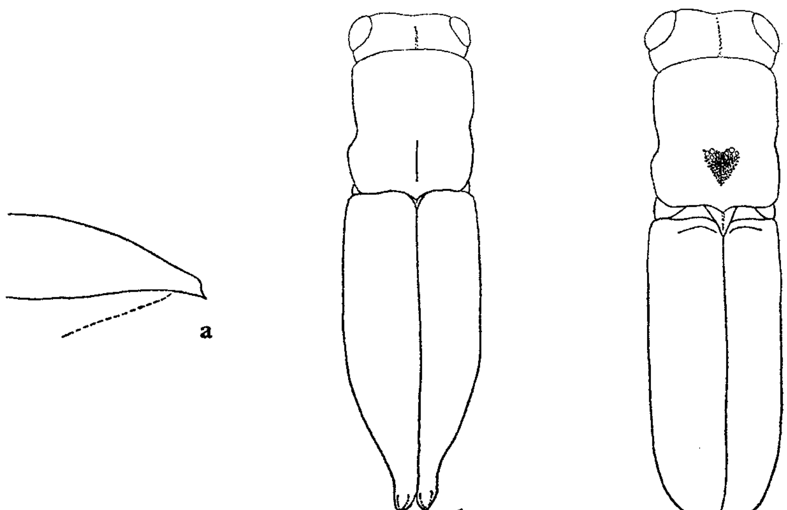


FIGURE 2.—*Platypus solidus:* **a,** lateral view, male declivity; **b,** dorsal view, male; **c,** dorsal view, female.

narrow median process; striae becoming wider near declivital base and granulate, interstriae gradually obliterated posteriorly; interspace 10 serrate on basal half of elytra, 8 carinate from declivital base to base of terminal process; terminal process obliquely truncate, lateral margins of truncate face elevated and emarginate; declivital interspaces bearing rows of blunt bristles, becoming more nearly hairlike on terminal process. Posteroventral margin of hind femur serrate.

Female: Similar to male except slightly longer; frons more finely granulate; pronotum with triangular patch of pores bisected by darkened portion of median line, four to seven pores on each side of anterior end of this portion of median line much larger; basal area of elytral interspace 3 asperate; strial and interstrial punctures reduced, obscure in some areas; interspace 10 not serrate; declivity gradual toward base, abrupt behind, surface smooth; elytra very broadly rounded behind, almost truncate.

DISTRIBUTION: India, Ceylon, Malaya, Tonkin, Java, New Guinea, Australia, S. Mariana Is., and western Caroline Is.

S. MARIANA IS. GUAM: Two, Barrigada, July 1936, Swezey; one, Fadang, Aug. 1936, Swezey; one, Machanao, June 1936, Swezey; eight, Pt. Oca, light trap, May-July 1945, G. Bohart and Gressitt; one, Pt. Ritidian, light trap, Aug. 1945, Gressitt.

PALAU. BABELTHUAP: Three, Ulimang, Dec. 1947, Dybas. NGERGOI: One, Aug. 1945, Hagen. PELELIU: Three, east coast, Aug. 1945, Dybas.

4. **Platypus acutidentatus** Murayama (fig. 3).

Platypus acutidentatus Murayama, 1956, Coleopt. Bull. **10**: 11.

Male: Length 4.3 mm.; body yellowish brown, darker toward declivital area of elytra, with elevated circumdeclivital margin black.

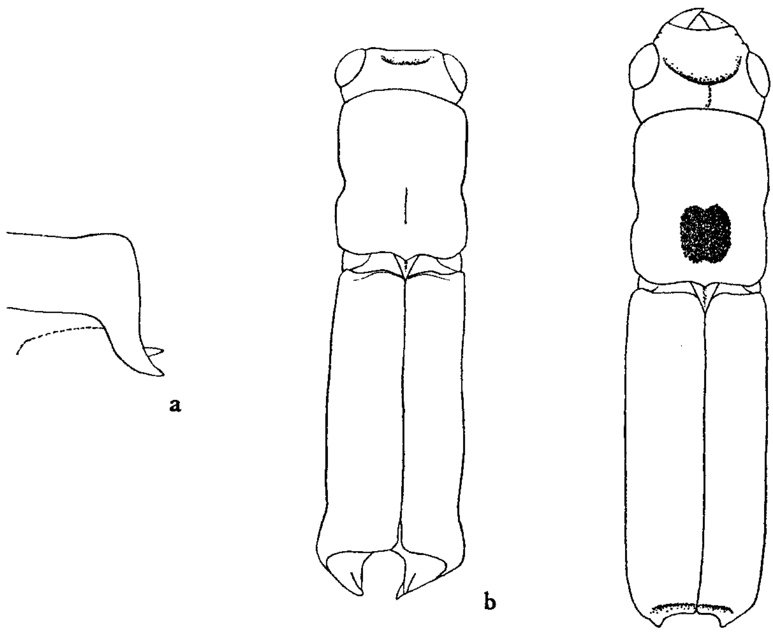


FIGURE 3.—*Platypus acutidentatus:* **a**, lateral view, male declivity; **b**, dorsal view, male; **c**, dorsal view, female.

Frons flattened, weakly impressed below level of antennal insertion and above upper level of eyes; surface dull, reticulate, punctures of moderate size, not close, very shallow, obscure.

Pronotum about 1.2 times as long as wide; sides moderately constricted on middle third, narrowest point just behind center; surface reticulate near anterior and posterior margins, remaining area smooth with microscopic pores and small, shallow, moderately close punctures; darkened portion of median line visible on slightly more than the second fifth from base.

Elytra 2.2 times as long as wide, widest at declivity; sides almost straight and subparallel on basal three-fourths, then dilated slightly just in front of declivity; basal margins sharp; striae 1 weakly, others not at all impressed, punctures small, close, not deep;

interstriae smooth, with almost imperceptible, irregular rows of very fine punctures; interspaces 3 and 5 slightly elevated toward base; strial and interstrial punctures larger just anterior to circumdeclivital expanded area, then obsolete on expanded portion. Declivity abrupt, vertical, deeply concave, margined by a strongly, sharply elevated, circumdeclivital ridge interrupted only at suture, narrowly above, rather broadly below, by a deep emargination; emargination extending from elytral apex about three-fourths of radius of declivital ring, sides of emargination armed by a pair of large teeth; surface smooth and shining. Posteroventral margin of hind femur serrate.

Female: Similar to male except frons deeply, concavely impressed from level of antennal insertion to vertex, deepest point at upper level of eyes, impressed gradually below, abruptly at vertex; pronotum with bioval patch of large pores divided by darkened portion of median line; elytral bases finely asperate, not carinate; elytra not expanded posteriorly, declivity abrupt, rather sharply margined, face subvertical and flattened, the apex very broadly emarginate, sides of emargination not armed.

DISTRIBUTION: Western Caroline Is. (Palau).

PALAU. BABELTHUAP: Eight (US, BISHOP, CNC), East Ngatpang, 65 m., light trap, Dec. 6, 9, 1952, Gressitt; one (BISHOP), Ngiwal, Oct. 16, 1951, Gressitt. KOROR: Four, Nov. 1952, Jan., Apr. 1953, Beardsley; two (CM), Dec. 2, 1947, Dybas; one, southwest Koror, light trap, Dec. 12, 1952, Gressitt. PELELIU: Four, at light, July 28, 1945, Aug. 1945, Hagen; nine (CM, CNC), north central, Aug. 1-28, 1945, Dybas.

Dr. J. J. Murayama kindly consented to designate 24 of these specimens as paratypes when it was learned that both he and I were preparing to describe the same species.

5. **Platypus jansoni** Chapuis (fig. 4).

Platypus jansoni Chapuis, 1865, Monographie Platypides, 244, fig. 146.—Strohmeyer, 1914, Genera Insectorum **163**: 27.—Beeson, 1938, Federated Malay States Mus., Jour. **18**: 295.

Male: Length about 4.8 mm.; body brown.

Frons moderately concave from eye to eye and from epistoma to vertex; surface closely granulate.

Pronotum 1.1 times as long as wide; sides moderately constricted on middle third, narrowest point just behind center; surface reticulate and finely, rather shallowly punctured; darkened portion of median line visible on second sixth from base.

Elytra 1.8 times as long as wide; sides straight, serrate on basal half, diverging slightly to declivital base; basal margins sharply elevated; striae moderately impressed, punctures confluent, obscure; interstriae about twice as wide as striae, moderately convex, surface reticulate and with very small, rather sparse punctures; interspace 10 finely serrate on basal half. Declivity convex, rather steep; interstriae narrower than on disc and uniseriately, finely tuberculate on upper half; striae and interstriae obscured below by finely granulate surface; a rather large, pointed tubercle located at point where interstriae 3 and 7 should intersect. Elytral vestiture limited to rather long, coarse declivital hair. Posteroventral margin of hind femur serrate.

Female: Similar to male except length about 5.3 mm.; frons weakly concave above level of antennal insertion, subinflated below, surface more finely granulate; pronotum 1.2 times as long as wide, with bioval patch of uniformly large pores bisected by darkened portion of median line; basal area of elytra finely asperate, margins incompletely carinate; declivity obliquely margined toward sides about one-third of distance from declivital base, no indication of striae or interspaces, and devoid of tubercles; hind femur not serrate.

DISTRIBUTION: Celebes, Moluccas, New Guinea, Key Is., Bismarck Archipelago, and Caroline Is.

PALAU. BABELTHUAP: One, Ngaremeskang (Ngarmisukan)-Emertao, Feb. 1938, Esaki; two, Ngiwal, Aug. 1951, Oct. 1951, Gressitt; one, Ollei, May 1953, Beardsley; two, Ulimang, Dec. 1947, Dybas. KOROR: One, Aug. 1952, Beardsley. ANGAUR: Two, Dec. 1951, Gressitt.

YAP. YAP: One, hill behind Yaptown, light trap, Nov. 1952, Gressitt; two, Kolonia, and three, Dugor, July-Aug. 1950, Goss. GAGIL-TOMIL: One, Gachapar, Sept. 1939, Esaki.

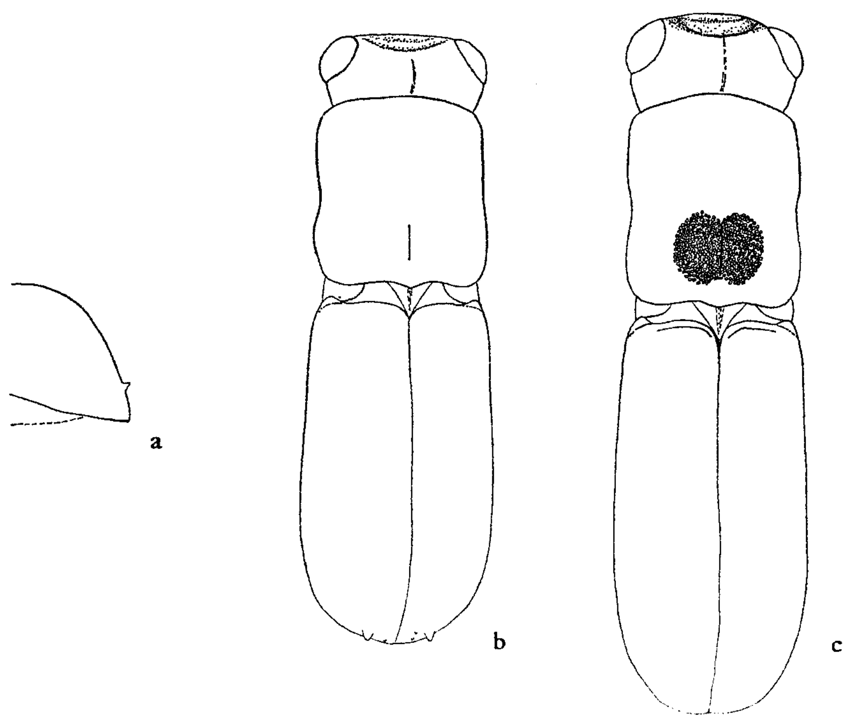


FIGURE 4.—*Platypus jansoni:* **a**, lateral view, male declivity; **b**, dorsal view, male; **c**, dorsal view, female.

KUSAIE. Fifteen, Hill 541, 165 m., light trap, Mar., Apr. 1953, 16, Hill 1010, 300 m., light trap, Apr. 1953, two, Mt. Matante, beating, Mar. 1953, two, Mwot, at light, Apr. 1953, three, Mt. Wakapp, and two, Malem River, 90 m., at light, Apr. 1953, and nine, Mutunlik, 22 m., Feb. 1953, five, Weye Cave, 1 m., Mar. 1953, all Clarke; three, Mar. 1937, McCall.

HOST: Breadfruit (*Artocarpus* sp.).

Family SCOLYTIDAE

Key to Micronesian Genera of Scolytidae

1. Basal margins of elytra at least weakly elevated and transversely crenulate........ 2
   Basal margins of elytra smooth and rounded, not elevated or crenulate................ 4
2. Crenulations of elytral bases forming a continuous straight line across suture, and extending laterally to striae 4; scutellum not visible; anterior area of pronotum rather closely, finely asperate..**Phloeotrypetus**
   Elytral bases arcuate, rows of crenulations extending laterally to about striae 8, and interrupted medially by scutellum; pronotum not closely asperate in anteromedian area.. 3
3. Eye entire; antennal funicle seven-segmented; anterolateral angles of pronotum usually with a few asperities..**Hylesinus**
   Eye deeply emarginate; antennal funicle five-segmented; pronotum devoid of asperities ....**Phloeosinus**
4. Antennal club strongly flattened and usually about equally pubescent on both faces, and sutures, when present, visible on both sides.. 5
   Antennal club obliquely truncate, densely pubescent only on anterior face, and sutures indicated by rows of setae only on anterior face, rarely near apex on posterior face..13
5. Elytra almost straight, abdomen ascending abruptly to meet them; eye emarginate; antennal funicle six-segmented, club large, oval, sutures not evident ....**Scolytomimus**
   Elytra posteriorly declivous, abdomen usually ascending slightly; eye emarginate or not; antennal funicle three- to five-segmented, club variable............. 6
6. Antennal club devoid of indications of sutures.. 7
   Antennal club with at least suture 1 clearly indicated by septum or by rows of setae 8
7. Eye entire; pedicle of antennal funicle about as long as wide; antennal club oval, not overlapping funicle...**Ptilopodius**
   Eye shallowly emarginate; pedicle at least twice as wide as long; antennal club subcircular, overlapping funicle laterally as far as apex of segment 2, and medially to middle of segment 2..**Erioschidias**
8. Antennal club with three sutures indicated by rows of setae, 1 not septate; summit of pronotum on basal third; body stout... 9
   Antennal club with suture 1 at least partly septate; summit of pronotum at, or anterior to, middle; body form more slender..10
9. Tarsal segment 3 stout; antennal funicle four-segmented; sutures of antennal club recurved..**Ericryphalus**
   Tarsal segment 3 cylindrical; antennal funicle five-segmented; sutures of antennal club procurved...**Hypocryphalus**
10. Septum of suture 1 of antennal club oblique, no other sutures indicated; antennal funicle four-segmented; eye entire..**Cryphalomorphus**
    Antennal club with three sutures indicated by setae, 1 transverse and septate; funicle with four or five segments; eye sinuate or emarginate......................11
11. Antennal funicle four-segmented; eye broadly sinuate; fine, raised lateral line of pronotum extending from base almost to anterior margin; female frons ornamented by long hair; pubescence of pronotum and elytra greatly reduced except on declivity; basal margins of elytra with fine raised line..........**Eidophelus**
    Eye emarginate; lateral line on basal third of pronotum; female frons without brush of long hair; male conspicuously smaller than female, rare; vestiture of pronotum and elytra more abundant; basal margins of elytra without fine raised line..12

12. Antennal funicle usually five-segmented; larger, more coarsely sculptured, usually with single row of interstrial bristles and single row of fine strial hair .... **Stephanoderes**

Antennal funicle usually four-segmented; smaller, more finely sculptured, usually with single row of erect interstrial bristles and multiple, confused rows of strial and interstrial hair .... **Hypothenemus**

13. Antennal funicle four-segmented; frons flattened, with rather dense, long pubescence in female, convex, with scanty pubescence in male .... **Carposinus**

Antennal funicle five-segmented; frons similar in both sexes, usually convex with scanty pubescence 14

14. Basal and usually lateral margins of pronotum with fine raised line; pronotum strongly arched, and asperate to base .... **Coccotrypes**

Basal and lateral margins of pronotum rounded; pronotum usually less strongly arched, and rarely asperate behind summit 15

15. Posterior tibiae slender, feebly dilated distally, subtruncate at apex, outer and distal margins armed by several rather large teeth; pronotum not strongly declivous anteriorly, anterior margin never armed; pregular area not depressed below general ventral surface of head .... **Poecilips**

Posterior tibiae broad, strongly dilated to middle, then rather gradually narrowed toward apex, outer margin armed by row of small, closely set teeth; pronotum usually strongly declivous in front, anterior margin often armed; pregular area depressed below general ventral surface of head .... **Xyleborus**

Genus **Hylesinus** Fabricius

Hylesinus Fabricius, 1801, Syst. Eleuth. **2**: 390.—Westwood, 1838 (1840), Synopsis Gen. Brit. Ins., 39 (type: *H. crenatus* Fabricius).—Hagedorn, 1910, Coleopt. Cat. **4**:15; 1910, Genera Insectorum **111**: 47.

This genus, in the broad sense, is cosmopolitan in distribution; it is rather well represented in southeastern Asia, the Philippine Islands, New Guinea, and neighboring areas. Although several species probably occur in Micronesia, only one species was collected.

6. **Hylesinus subcostatus** Eggers.

Hylesinus subcostatus Eggers, 1923, Zool. Meded. Roy. Mus. Nat. Hist. Leyden **7**: 137; 1927, Treubia **9**: 406.

Hylesinus crassus Beeson, 1929, Insects of Samoa **4** (4): 220.—Schedl, 1954, Philippine Jour. Sci. **83**: 137.

Female: Length 2.2-2.3 mm., 2.0 times as long as wide; color light brown.

Frons rather weakly convex, shallowly impressed on small median area; epistomal margin produced in front of mandibles; surface reticulate and obscurely, closely subgranulate-punctate. Eye elongate, rather deeply sinuate on inner margin; rather finely granulate.

Pronotum about 1.1 times as wide as long; sides rather strongly arcuate, moderately rounded in front; dorsal surface transversely impressed on anterior third; surface very closely, deeply punctured, punctures of irregular size, anterolateral angles armed by about three coarse asperities, more or less subasperate toward sides on anterior two-thirds, lateral margins elevated only toward base and only slightly irregular; vestiture consisting of short, stout, rather abundant, semirecumbent setae.

Elytra 1.3 times as long as wide, 1.7 times as long as pronotum; sides very feebly arcuate on slightly more than anterior half, rather narrowly rounded behind; elytral bases

each armed by about 12 to 14 transverse crenulations; striae impressed, punctures rather small and deep; interstriae about as wide as striae, irregular but appearing convex at least toward declivity, punctures indistinct, with their anterior margins transversely elevated, a few of those toward elytral bases subasperate. Declivity rather steep, convex; alternate interspaces more strongly elevated, 1 and 9 join at apex, 2 to 8 end short of 9, except 7 which almost reaches 9; interspaces more nearly carinate than on disc, and granules somewhat larger. Vestiture consisting of minute, inconspicuous strial hair; and groundwork of short, almost scalelike interstrial setae, with rows of longer, erect, lanceolate scales, each scale more than four times as long as wide and shorter than distance between rows of scales.

Male: Similar to female except frons deeply impressed, with sides elevated and subcarinate over antennal bases; anterior area of pronotum appearing more nearly flattened, with anterolateral asperities extending on anterior margin almost to median line.

DISTRIBUTION: Sumatra, Samoan, Fijian, Society, S. Mariana, Caroline, Marshall, and Gilbert Is.

S. MARIANA IS. GUAM: One, sweeping, Dec. 1947, Maehler; four, breadfruit (reared), Apr. 1948, Maehler; one, 2 km. southeast of Asan, 200 m., Oct. 1947, Dybas; two, Com. Mar. Hill, Apr. 1943, Maehler; one, Piti, *Ipomoea,* Apr. 1948, Maehler; two, Yigo, Feb. 1958, Krauss.

PALAU. KOROR: One, limestone ridge south of inlet, Jan. 1948, Dybas. ULEBSEHEL: Three, Jan. 1948, Dybas.

CAROLINE ATOLLS. NOMWIN: Nomwin I., one, Feb. 1954, Beardsley.

TRUK. PATA: One, Sabote, Apr. 1940, Yasumatsu and Yoshimura. TON: One, Feb. 1948, Dybas; one, Apr. 1940, Yasumatsu and Yoshimura; one, Mt. Unibot, Dec. 1952, Gressitt. WENA: One, 1,200 m., June 1946, Townes; one, 180 m., July 1946, Townes; one, east of Distad (Civ. Admin. Area), Feb. 1953, Gressitt.

PONAPE. One, Colonia, near sea level, breadfruit, Feb. 1948, Dybas.

MARSHALL IS. NAMU: One, Majkon I. Oct. 1953, Beardsley. WOTHO: One, Wotho I., Oct. 1953, Beardsley.

GILBERT IS. BUTARITARI: One, Butaritari I., Dec. 1957, Krauss.

HOST: Breadfruit (*Artocarpus* sp.) and *Ipomoea* sp.

Genus **Phloeosinus** Chapuis

Phloeosinus Chapuis, 1869, Synopsis Scolytides, 37.—Hagedorn, 1910, Coleopt. Cat. **4**: 25; 1910, Genera Insectorum **111**: 64.—Hopkins, 1914, U. S. Nat. Mus., Proc. **48**: 126 (type: *Hylesinus thujae* Perris).

This genus is cosmopolitan in distribution; the greatest concentration of species is in North America. In general, the species of this genus breed under the bark of cupressine and taxodiine trees.

7. **Phloeosinus pacificus** Wood, n. sp.

Male: Length 1.5 mm. (paratypes 1.5-1.7 mm.), 2.0 times as long as wide; body rather dark brown, elytra lighter shade of brown.

Frons narrowly, rather deeply, subcircularly concave below upper level of eyes; a short, narrow, low, toothlike median carina ending almost at epistomal margin; surface closely, deeply, rather finely punctured except in deepest portion of concavity; vestiture short and inconspicuous. Eye very deeply emarginate, almost divided, the two halves connected by only two or three facets (completely divided in some paratypes). Antennae as in *Phloeosinus australis,* but sutures more nearly oblique.

Pronotum 1.13 times as wide as long; widest just behind middle, sides strongly arcuate and rather strongly constricted just behind anterior margin, posterior angles rounded; surface closely, rather coarsely punctured, median line impunctate near middle.

Elytra 1.4 times as long as wide; sides subparallel on basal two-thirds, rather broadly rounded behind; striae strongly, narrowly impressed, punctures small, usually distinct, and separated by a distance equal to their own diameters; interstriae about one and a half times as wide as striae, punctures in indefinite rows, small, close, surface feebly, transversely crenulate. Declivity convex, rather steep; interspaces 1 and 3 a little more convex; 1 with about four moderately large tubercles on lower half and several smaller ones on upper half; tubercles on 3 a little larger and evidently more numerous; 2 as wide as 1 and 3, with one tubercle near apex; 4 (usually) unarmed, 5 to 9 with a few tubercles, those on 7 a little larger and more numerous. Vestiture largely confined to declivity, consisting of rather slender erect scales, those in indefinite median rows of each interspace slightly longer.

Female: Similar to male except frons flattened, with feeble median impression, a fine, low, rather long median carina, and vestiture longer and somewhat more abundant; declivital interspace 2 finely tuberculate.

Holotype, male (CM), Ngergoi (Garakayo), Palau Is., Aug. 7, 1945, Dybas; allotype, female (CM), same data. Paratypes: Seven (CM, US, BISHOP, CNC), same data as for holotype; six, Ngerehelong, Babelthuap, Dec. 18, 1947, Dybas.

DISTRIBUTION: Caroline Is. (Palau).

This species is allied to *Phloeosinus australis* Schedl but is readily distinguished by the smaller size, and by the sculpture of the frons and elytra.

Genus **Phloeotrypetus,** new genus

Type: *Phloeotrypetus palauensis* Wood, n. sp.

Body form small, cylindrical; frons flattened, moderately pubescent; eye large, entire, coarsely faceted; antennal scape rather long and slender, funicle rather short, four-segmented, club elongate-ovate with sides weakly constricted at scarcely perceptible sutures. Pronotum about as long as wide, anterior half closely and finely asperate; lateral and basal margins rounded. Elytral bases armed by a straight row of coarse, elevated crenulations crossing suture and extending laterally to striae 4; scutellum not visible; surface rather finely sculptured. Anterior coxae contiguous; tibiae similar to *Liparthrum.* Vestiture hairlike, except minutely scalelike to subplumose along margins of metepimeron and episternum.

This genus is allied to *Hypoborus* Erichson, *Liparthrum* Wollaston, and *Phloeochilus* Schedl, but may be readily distinguished by the more elongate body form, by the more closely asperate anterior half of the pronotum, by the much larger and more coarsely faceted eyes, by the more elongate and more finely sculptured elytra, and by the more slender elytral setae. These genera form a compact group that can be distinguished from other genera of Scolytidae by the crenulations of the elytral bases which form a continuous straight line

across the suture and continue laterally to about striae 4 (the scutellum is not visible), by the elongate, club-shaped antennal scape, four- or five-segmented funicle, and subsolid, flattened club with sutures indicated only by lateral constrictions and sometimes by a few setae, and by the anteromedially asperate pronotum.

8. **Phloeotrypetus palauensis** Wood, n. sp. (fig. 5, *a, b*).

Female: Length 1.25 mm., 2.6 times as long as wide; body color brown.

Frons feebly, rather broadly concave, with epistomal margin weakly raised; surface indistinctly reticulate, and with rather fine, moderately abundant punctures; vestiture fine, much longer above, directed orad. Eye entire, large, and coarsely faceted. Antennae very similar to species of *Liparthrum;* scape rather long and slender; funicle shorter and four-segmented; club a little longer than scape, shining, with sutures obscurely indicated by lateral constrictions and a few setae.

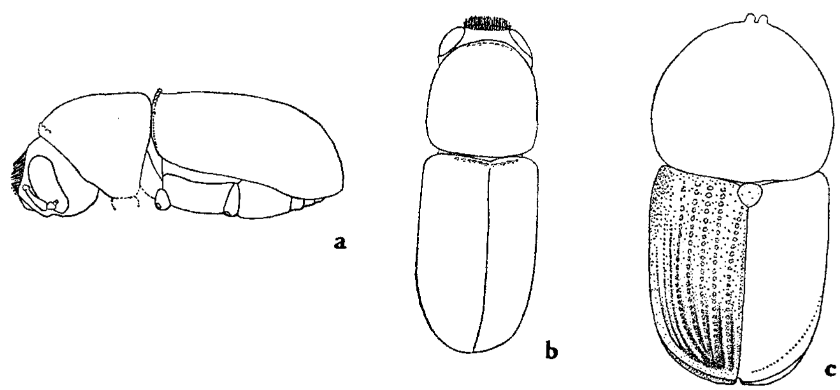


FIGURE 5.—**a, b,** *Phloeotrypetus palauensis: a,* lateral view; *b,* dorsal view. **c,** *Scolytomimus bicolor,* dorsal view.

Pronotum as long as wide; sides almost straight and subparallel on basal half, moderately rounded in front, anterior margin armed by a row of about six small, scarcely perceptible teeth; surface rather finely and closely asperate except at sides, asperities smaller and sparse on posterior half, asperate area reticulate, lateral areas smooth and shining, with few minute punctures; vestiture short, sparse, hairlike.

Elytra 1.7 times as long as wide, 1.9 times as long as pronotum; elytral bases elevated and armed laterally to striae 4 by a single continuous row of coarse marginal crenulations, scutellum not visible; striae 1 weakly, others imperceptibly impressed, punctures small and rather deep; interstriae as wide as striae, each with a row of granulate setiferous punctures, punctures about two-thirds as numerous on disc as strial punctures. Declivity moderately steep, weakly convex; more coarsely and closely granulate than on disc. Vestiture consisting of uniseriate rows of fine, short, recumbent strial hair, and uniseriate rows of erect, moderately long, interstrial bristles. Margins of metepimeron and metepisternum bearing a row of small scales.

Holotype, female (US 64624), Koror, Palau Is., at light, Apr. 1953, Beardsley.

DISTRIBUTION: Caroline Is. (Palau).

Genus **Scolytomimus** Blandford

Scolytomimus Blandford, 1895, Ann. Mag. Nat. Hist. VI, **15**: 319 (type: *S. dilutus*).—Hagedorn, 1910, Coleopt. Cat. **4**: 81; 1910, Genera Insectorum **111**: 135.

This rather small genus is limited in its distribution to southeastern Asia, Indonesia, the Philippine Islands, and eastward to the Samoan Islands.

9. **Scolytomimus bicolor** Wood, n. sp. (fig. 5, *c*).

Female: Length about 1.5 mm., 2.0 times as long as wide; color yellowish brown, darker on irregular patches at sides of pronotum, elytral bases, and on elytral declivity.

Frons broadly flattened from epistomal margin to above upper level of eyes; surface finely rugose, rugose-reticulate above and at sides of head; vestiture on flattened area consisting of short, fine, rather abundant hair.

Pronotum about 1.2 times as wide as long, subglobular; anterior area with a few coarse asperities, more finely asperate toward base; anterior margin armed by two rather slender, closely set teeth; surface, except asperities, reticulate, posterolateral areas rather coarsely, shallowly punctured; basal and lateral margins with a fine raised line.

Elytra 1.2 times as long as wide, 1.3 times as long as pronotum; striae impressed, punctures rather large, obscure, evidently confluent; interstriae about as wide as striae, convex on disc, becoming carinate on declivity, surface reticulate, with fine, confused, rather sparse punctures. Declivity gradual, scarcely descending, elytra appearing almost straight; interspace 9 more strongly elevated, posteriorly carinate, and continuing to elytral apex, joining 1 and 2; 3 to 8 ending short of 9; 3 and 5 fused apically (fusion complete only on left elytron of type).

Holotype, female (US 64625), east of Ngatpang, 65 m., Babelthuap, Palau Is., light trap, Dec. 7, 1952, Gressitt.

DISTRIBUTION: Caroline Is. (Palau).

This species appears to be more closely allied to *Scolytomimus maculatus* Beeson than to other representatives of the genus; it differs from other known species of the genus by the flattened, finely pubescent frons, and by the distinctive sculpture of the elytra.

Genus **Ptilopodius** Hopkins

Ptilopodius Hopkins, 1915, U. S. Dept. Agric., Rept. **99**: 11 (type: *P. stephegynis*).

Species of this genus have been reported from the Indo-Malayan Region, the East Indies, the Philippine Islands, eastward in the islands of the Pacific to the Hawaiian Islands, and from South America.

Key to Micronesian Species of Ptilopodius

1. Asperities of pronotum narrow, their widths scarcely greater than their thicknesses, and confused; teeth on anterior margin of pronotum irregular in size, spacing, and number; posterior area of pronotum coarsely reticulate, and with rather close, coarse, granulate punctures; frons coarsely reticulate to vertex, without smooth, shining, median area; interstrial scales narrow and rather sharply pointed; length 1.2 mm. .... **10. dubiosus**

Asperities of pronotum broad, their widths conspicuously greater than their thicknesses, and usually arranged in indefinite concentric rows toward summit; anterior margin of pronotum armed by six to eight teeth, positions and size of teeth regular, median ones usually larger; frons either with or without smooth shining median area extending from vertex to point below upper level of eyes; tips of interstrial scales rounded........ 2

2. Length 1.1-1.3 mm.; frons with smooth, shining median area on upper half extending toward vertex; anterior margin of pronotum not produced, armed by six teeth, median ones only slightly larger; anterior tibiae and tarsi ornamented by a few shorter, subplumose setae........**11. pacificus**

Length 1.4-1.8 mm.; upper median area of frons finely reticulate; anterior margin of pronotum rather strongly produced and armed by six to eight teeth, median ones much larger; anterior tibiae and tarsi usually ornamented by a few rather long, plumose setae........**12. ramosus**

10. **Ptilopodius dubiosus** Wood, n. sp.

Female: Length 1.16 mm. (paratypes 1.09-1.25 mm.), 2.1 times as long as wide; body dark brown, elytra a lighter shade of brown.

Frons convex, with a narrow, transverse impression just above epistoma, and with a large, rather deep puncture at center; surface rather coarsely reticulate, reticulation finer above and continuing to vertex; vestiture rather short and scanty. Eye elongate, entire; finely granulate. Antennal club rather large, moderately pubescent, and without indications of sutures.

Pronotum 1.08 times as wide as long; widest near base, sides weakly arcuate and abruptly converging on anterior third, rather narrowly rounded in front, anterior margin armed by four small, widely spaced teeth (their position, number, and size irregular in type series); summit just behind middle, not high; anterior area armed by numerous, small, narrow, confused asperities; posterior area coarsely reticulate and with rather numerous punctate (volcanolike) granules, more finely sculptured laterally. Vestiture rather abundant and short, consisting of fine and coarse erect setae.

Elytra 1.23 times as long as wide, about 1.4 times as long as pronotum; sides straight and subparallel on basal two-thirds, very broadly rounded behind; striae narrow, punctures small, moderately impressed; interstriae wider than striae, each with a row of rather close, large, setiferous, punctate granules. Declivity steep, convex; strial punctures smaller than on disc, interstrial granules as high as on disc, but their diameters smaller and punctures usually not readily apparent. Vestiture consisting of uniseriate rows of small, fine, recumbent hair; and uniseriate rows of erect, slender, interstrial scales, each scale at least six times as long as wide and with apex usually pointed; special plumose setae of fore tibiae and tarsi not apparent.

Male: Similar to female in all respects, except slightly smaller.

Holotype, female (US 64626), east coast, Peleliu, Palau Is., from *Pandanus* leafstock, Jan. 26, 1948, Dybas; allotype, male (US), same data. Paratypes: 77 (CM, US, BISHOP), same data as for holotype; five (CNC), Ulimang, Babelthuap, Palau Is., Dec. 9, 1947, Dybas.

DISTRIBUTION: Caroline Is. (Palau).

HOST: *Pandanus* sp.

This species combines certain of the characters of most species of *Ptilopodius* and of some *Cryphalomorphus*. The antennae and the subsulcate scutellum are typical of *Ptilopodius*; while the size, shape, and arrangement of asperities on the pronotum are similar to those of several of the smaller *Cryphalomorphus*

species. This species is more closely allied to *pacificus* than to other known species, but can be readily distinguished by the characters summarized in the key.

11. **Ptilopodius pacificus** Schedl.

Hypothenemus sylvicola, Schedl, 1934, Stylops **3**: 179.

Ptilopodius pacificus Schedl, 1940, Hawaiian Ent. Soc., Proc. **11** (1): 111. —Swezey, 1940, Hawaiian Ent. Soc., Proc. **11** (1): 119.

Female: Length 1.1-1.3 mm., 2.0 times as long as wide; color light brown.

Frons convex above, flattened below, with median line and epistoma weakly elevated; surface rugose-reticulate, except median area smooth and shining above upper level of eyes; punctures obscure, not close, a larger puncture usually visible at center; vestiture inconspicuous, sparse, rather short, hairlike.

Pronotum 1.1 times as wide as long; sides convergently arcuate toward rather narrowly rounded anterior margin; anterior margin armed by six teeth, median ones slightly larger; asperities wider than thick, more abundant toward summit; surface reticulate, posterior and lateral areas finely, sparsely, obscurely punctured; vestiture consisting of short, semierect bristles.

Elytra 1.1 times as long as wide, 1.3 times as long as pronotum; sides almost straight and subparallel on basal half, rather broadly rounded behind; striae not impressed, punctures moderately large, rather close; interstriae as wide as striae, with uniseriate, granulate, squamiferous punctures. Declivity rather steep, convex; strial punctures deeper, and interstriae narrower than on disc. Vestiture consisting of slender erect scales, each about four times as long as wide; and minute, recumbent strial hair, one hair arising from each puncture.

Tarsal hairs scarcely plumose, filaments very short.

Male: Similar to female in all respects.

DISTRIBUTION: Hawaiian, S. Mariana, Caroline, and Marshall Is.

S. MARIANA IS. SAIPAN: One, Banaderu-Tanapag, May 1940, Yasumatsu and Yoshimura; 89, As Mahetog, Halaihai-As Teo, Papako, and Talofofo areas, 1944 and 1945, Dybas. TINIAN: Sixteen, Mt. Lasso, beating, Apr. 1945, Dybas. GUAM: Four, Fadang, May 1945, Dybas; 38, Malolos, dead tree, Sept. 1937, Oakley.

KUSAIE. One, Hill 541, 165 m., beating, Mar. 1953, Clarke.

MARSHALL IS. ARNO: 26, Ine I., Aug. 1950, La Rivers.

HOSTS: *Hibiscus tiliaceus* and *Samanea saman* (Hawaiian Is.).

This species is allied to *Ptilopodius ramosus,* but may be readily distinguished by its smaller size, by the presence of a smooth shining median area above the upper level of the eyes, by the more broadly rounded anterior margin of the pronotum, and by the less elaborate tarsal setae.

Variation in the sculpture of the Micronesian specimens examined is almost imperceptible. These specimens are identical in every respect with a series taken by Swezey at Waimano, Oahu, in the Hawaiian Islands.

12. **Ptilopodius ramosus** Beeson.

Ptilopodius ramosus Beeson, 1922, Indian Forester, 498 (*nom. nud.*); 1935, B. P. Bishop Mus., Bull. **142**: 115, fig. 1; 1938, Federated Malay States Mus., Jour. **18**: 290.

Female: Length 1.4-1.8 mm., 2.1 times as long as wide; color light brown.

Frons convex above, moderately impressed above epistoma, epistoma elevated, smooth, shining; surface subrugose-reticulate, finely, sparsely punctured; vestiture inconspicuous, sparse, short, hairlike.

Pronotum about equal in length and width; sides convergently arcuate toward very narrowly rounded anterior margin; anterior margin armed by four to eight teeth, median pair larger; asperities more numerous toward summit, much wider than thick; posterior and lateral areas finely reticulate, finely punctured, punctures becoming subgranulate behind summit; vestiture short, rather sparse, subsquamose toward base.

Elytra 1.2 times as long as wide, 1.3 times as long as pronotum; sides straight and subparallel on basal half, rather broadly rounded behind; striae not impressed, punctures small; interstriae wider than striae, the punctures uniseriate, granulate, squamiferous. Declivity rather steep, convex; strial punctures more deeply impressed, interstriae narrower. Tarsal setae and some setae at apex of tibiae of fore legs plumose, filaments rather long.

Male: Similar to female.

DISTRIBUTION: India, Mangareva, Society, and Caroline Is.

PALAU. KOROR: Five, Apr., May 1953, Beardsley; one, 25 m., light trap, Dec. 1952, Gressitt. PELELIU: One, Aug. 1944, Dybas.

YAP. YAP: Forty-one, Kolonia, July-Aug. 1950, Goss. GAGIL-TOMIL: One, Tomil District, July-Aug. 1950, Goss.

TRUK. TON: One, Mt. Unibot, at light, Dec. 1952, Gressitt.

PONAPE. Four, Madolenihm (Metalanim) Plantation, June-Sept. 1950, Adams; one, Agric. Exper. Sta., Colonia, 16 m., light trap, Jan. 1953, Gressitt.

This species may be readily separated from the other Micronesian representatives of the genus by the larger size, by the absence of a smooth shining area above the frons, by the more strongly produced anterior margin of the pronotum, and by the more elaborately plumose tarsal setae.

Genus **Erioschidias** Schedl

Erioschidias Schedl, 1938, Roy. Soc. S. Australia, Trans. **62**:42 (type: *Cryphalus setistriatus* Lea).

Representatives of this small genus are known to occur in the area from Burma to Australia. Only one species was found in Micronesia.

13. **Erioschidias frontalis** Wood, n. sp. (fig. 6).

Male: Length 1.3 mm., 2.4 times as long as wide; color brown.

Frons rather deeply concave on narrow area, occupying half of distance between eyes, from just above epistoma to vertex; surface finely rugose-reticulate, finely punctured in areas lateral to concavity; vestiture inconspicuous, sparse, rather long. Eye emarginate; finely granulate. Antennal scape shorter than club; funicle three-segmented, pedicle short, twice as wide as long, and longer than combined lengths of two remaining segments; club subcircular, rather thick and without indications of sutures, anterior face convex, basal angles produced slightly and overlapping about one and a half segments of funicle, surface uniformly pubescent.

Pronotum about equal in length and width; widest just behind middle, sides weakly arcuate on basal half; anterior margin rather narrowly rounded, armed by ten rather small teeth; anterior area moderately declivous, finely asperate; posterior area reticulate and

rather coarsely, deeply, closely punctured; summit indefinite, transition from asperate to punctate areas rather gradual; vestiture inconspicuous, consisting of fine, rather short hair, and, in basal area, a few slender scales.

Elytra 1.4 times as long as wide; sides straight and subparallel on basal half, rather narrowly rounded behind; striae not impressed, punctures moderately large, shallow; interstriae narrower than striae, subreticulate, punctures fine, regular, squamiferous. Declivity rather steep, convex. Vestiture consisting of rows of erect interstrial scales, each scale more slender basally and about five times as long as wide; and rows of minute strial hair, one hair arising from each puncture.

Female: Similar to male except frontal concavity reduced, occupying about one-fourth of distance between eyes, and extending dorsally only to upper level of eyes.

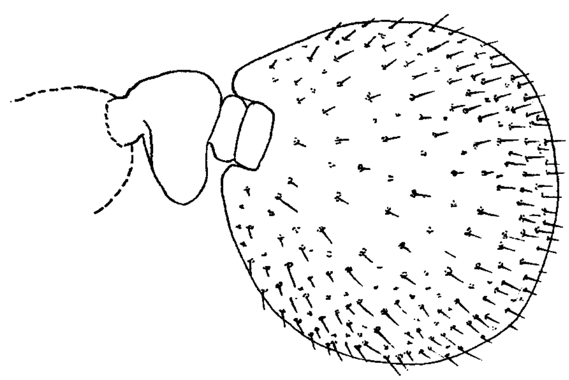


FIGURE 6.—*Erioschidias frontalis,* anterior face, right antennal club.

Holotype, male (US 64627), Ulebsehel (Aurapushekaru) Is., Palau, beating native vegetation, Jan. 14, 1948, Dybas; allotype, female (US), Peleliu, Palau, beating vegetation, Jan. 27, 1948, Dybas. Seven paratypes (US, CM, BISHOP, CNC), all Palau: Peleliu, sweeping roadside vegetation, Jan. 29, 1948, Dybas; Koror, limestone ridge north of inlet, beating vegetation, Jan. 1948, Dybas; Auluptagel (Ulebsehel), sweeping native vegetation, Feb. 7, 1952, Beardsley. Two paratypes, Truk: Dublon (Tonoas), 300-360 m., May 28, 1946, Townes; Wena (Moen), 180 m., July 31, 1946, Townes.

DISTRIBUTION: Caroline Is. (Palau, Truk).

Genus **Ericryphalus** Hopkins

Ericryphalus Hopkins, 1915, U. S. Dept. Agric., Rept. **99**: 38 (type: *E. henshawi*).

The groups of species formerly included in the genus *Cryphalus* Erichson represent, in some cases, a composite of unrelated genera. Since *Cryphalus* has been redefined (Wood, 1943, Univ. Kansas Sci. Bull. **36**: 990), a critical analysis of the complex is now necessary before many tropical species can be as-

signed to appropriate genera. The species of this complex from Micronesia appear quite unrelated to the Holarctic genus *Taenioglyptes* and are assigned to Hopkins' genus *Ericryphalus* for the purposes of this study.

Key to Micronesian Species of Ericryphalus

1. Vestiture on posterior areas of pronotum and on anterior and posterior areas of elytra consisting of groundwork of small abundant scales in addition to longer setae 2
   Vestiture on posterior areas of pronotum and basal areas of elytra consisting of groundwork of small hairlike setae; groundwork of scalelike vestiture confined to elytral declivity........ **15. longipilus**
2. Declivital bristles slender, almost hairlike, longer, and widely spaced....**16. minimus**
   Declivital bristles scalelike, shorter, rather closely spaced........**14. sylvicola**

14. **Ericryphalus sylvicola** (Perkins).

Hypothenemus sylvicola Perkins, 1900, Fauna Hawaiiensis **2** (3) : 181.

Ericryphalus henshawi Hopkins, 1915, U. S. Dept. Agric., Rept. **99** : 38.

Ericryphalus sylvicola, Schedl, 1941, Hawaiian Ent. Soc., Proc. **11** (1) : 111.—Swezey, 1941, Hawaiian Ent. Soc., Proc. **11** (1) : 119.

Cryphalus swezeyi Schedl, 1942, B. P. Bishop Mus., Bull. **172** : 147 (n. syn.).

Cryphalus sylvicola var. *obliquus* Schedl, 1950, B. P. Bishop Mus., Occ. Papers **20** (3) : 48 (n. syn.) ; 1951, B. P. Bishop Mus., Occ. Papers **20** (10) : 133.

Female: Length 1.05-1.42 mm., 2.1 times as long as wide; body brown.

Frons weakly convex, surface reticulate and finely, sparsely punctured; mandible with two dentations.

Pronotum slightly wider than long; sides widest at base, convergently arcuate toward narrowly rounded anterior margin; anterior margin armed by two to six serrations, median pair distinctly larger; vestiture consisting of fine short hair, intermixed on posterior half with small scales.

Elytra 1.3 times as long as wide; sides indistinctly arcuate on basal two-thirds, rather broadly rounded behind; striae not impressed, punctures obscure; interstriae closely punctured, punctures confused, almost as large as those of striae. Declivity rather steep, moderately convex; strial and interstrial punctures reduced. Vestiture consisting of a groundwork of abundant, small, interstrial scales; and median rows of longer setae, those on disc hairlike, scalelike on declivity.

Male: Similar to female except epistoma rather deeply, broadly emarginate; vertex with sharply elevated, rather long, transverse carina; mandible with three dentations; pronotum more gradually declivous, anterior margin more strongly produced, and asperities reduced in number and size.

DISTRIBUTION: Hawaiian, Fijian, Samoan, Mariana, and western Caroline Is.

N. MARIANA IS. Pagan: One, Laguna, Apr. 1940, Yasumatsu and Yoshimura; one, Songsong, Apr. 1940, Yasumatsu and Yoshimura.

S. MARIANA IS. Saipan: Five, Jan. 1945, Hagen; four, As Mahetog

area, Nov. 1944, one, *Pandanus,* Mar. 1945, two, Jan. 1945, two, near Garapan, Dec. 1944, one, Hagman Point, Apr. 1945, one, Halaihai-As Teo area, Jan. 1945, one, Feb. 1945, ten, Kalabera area, Jan. 1945, two, Feb. 1945, four, Mt. Tagpochau, 375 m., Feb. 1945, two, Papago area, Jan. 1945, one, Jan. 1945, two, Magpi Mt. (Pidos Kalahe), Apr. 1945, one, Talofofo ridge, Jan. 1945, 55, Tuturam, Laulau Bay, Jan. 1945, all Dybas; one, Garapan-Sadog Tasi, May 1940, and one, Fanaganan, May 1940, Yasumatsu and Yoshimura. TINIAN: One, Marpo Valley, Apr. 1945, three, Mt. Lasso, Apr. 1945, two, Mar. 1945, all Dybas. GUAM: Three, Mar. 1948, Dybas; one, June 1945, Stuntz; one, June 1945, Chaffee; three, Pt. Ritidian, May 1945, Dybas, Aug. 1945, Gressitt; five, Amantes Pt., May 1945, Dybas; four, Pt. Oca, May 1945, Dybas; Pt. Oca, June 1945, G. Bohart and Gressitt; one, Agana, May 1945, Dybas; 30, Fadang, May 1945, Dybas; three, Mt. Alifan, Apr. 1946, Krauss; three, Talofofo, Apr. 1946, Krauss; one, Mt. Bolanos, Aug. 1952, Krauss; one, near Merizo, July 1945, G. Bohart and Gressitt; six, Pati Pt., June 1945, Dybas.

PALAU. PELELIU: One, east coast, Aug. 1945, Dybas.

Because of the variability of this species, the descriptions were prepared from specimens collected in the Hawaiian Islands, the type locality. Specimens representing five series of this species from the Hawaiian Islands average about 1.3 mm. in length; more than a third of them measure less than 1.25 mm. Since the range of variation in size completely overlaps that of Schedl's variety *obliquus* and since the profiles of the anterior margin of the pronotum and the slope of the elytral declivity are sufficiently variable that Fijian and Micronesian specimens can be included in the species, the varietal name *obliquus* must be withdrawn.

Specimens from Guam were described by Schedl as *Cryphalus swezeyi*; they were distinctly larger, 1.46 to 1.60 mm., perhaps less slender, and the elytral disc was more distinctly striate than Hawaiian specimens. In addition to part of Schedl's type series, 15 specimens from Guam and 102 specimens from Saipan and Tinian have been studied. These specimens were divided into four classes as follows: (a) larger than 1.5 mm., with the elytral disc striate; (b) larger than 1.5 mm., the strial punctures obsolete; (c) smaller than 1.5 mm., with the elytral disc striate; and (d) smaller than 1.5 mm., the strial punctures obsolete. Of the 15 specimens from Guam, nine were in class a, one in b, one in c, and four in d. Fifty specimens from Tuturam, Saipan, were distributed as follows: a, 31; b, one; c, eight; and d, 10; and 37 specimens from all other Saipan localities: a, five; b, eight; c, seven; and d, 17. Of the 15 specimens from Tinian, five were in class c, and 10 in class d. The specimens examined from the Samoan, Fijian, Palau, and Hawaiian Islands all fall into class a. From these data it appears that the more typical *Ericryphalus sylvicola,* as exemplified by class d, was widely distributed in the Pacific islands. At a later

date a subspecies of this form, or a closely allied species presumably exemplified by specimens in class a, was introduced into Guam. The resultant hybridization, in combination with other factors, has now virtually eliminated the original form there. Similar swamping appears to be occurring now in Saipan, but it is in a much earlier stage.

For the purposes of this study, the name *E. swezeyi* Schedl is considered to be only a morphological variation of *E. sylvicola* (Perkins) and, as such, must be recognized as a synonym of that species.

15. **Ericryphalus longipilus** (Schedl).

Cryphalus longipilus Schedl, 1943, Ent. Blätter **39**: 34.

Female: Length 1.5-1.7 mm., 2.0 times as long as wide; color yellowish brown.

Frons weakly convex, surface reticulate, with shallow, moderately abundant punctures.

Pronotum 1.2 times as wide as long; widest one-third distance from base; sides arcuately convergent, moderately constricted just behind anterior margin, rather narrowly rounded in front; anterior margin armed by about eight serrations, median pair larger; summit on posterior third, anterior area armed by numerous, small, isolated, confused asperities; posterior and lateral areas reticulate and rather closely and coarsely punctured; vestiture consisting of moderately abundant, rather long hair.

Elytra 1.1 times as long as wide, 1.4 times as long as pronotum; scutellum reduced; basal margins with fine raised line, sides straight and subparallel on basal half, rather broadly rounded behind; striae 1 weakly impressed, particularly near declivity, others obscure, punctures reduced, rather obscure; interstriae with fine abundant punctures. Declivity convex, not steep; striae impressed, particularly striae 1, punctures more strongly impressed. Vestiture on disc with groundwork of short hairlike setae, and each interspace with a row of long erect hair; on declivity with groundwork of fine scales, and each interspace with a row of long erect hair; long hairs at base of interspace 1 densely placed, stout, and more reddish in color, forming a conspicuous tuft.

Male: Similar to female except long setae at base of declivital interspace 1 similar in thickness and abundance to those of other interspaces.

DISTRIBUTION: Philippine and western Caroline Is.

PALAU: BABELTHUAP: Wooded valley west of Ulimang, Dec. 1947, Dybas.

This species is allied to *Ericryphalus sylvicola,* but may be distinguished by the absence of long, scalelike setae on the declivity, by the absence of the deeply emarginate epistoma of the male, and by the presence of a tuft of coarse setae at the base of declivital interspace 1 in the female.

Three Micronesian specimens were examined in addition to one specimen that was determined by Schedl (presumably a cotype).

16. **Ericryphalus minimus** (Eggers).

Cryphalus minimus Eggers, 1927, Philippine Jour. Sci. **33**: 76.

Female: Length 1.1-1.2 mm. (type 0.8 mm.), about 2.1 times as long as wide; color yellowish brown.

Frons convex above, impressed on slightly less than semicircle above mandibles in such a way that inner margin of mandibles overlaps epistoma; surface above impression reticulate and punctured; vestiture scanty, hairlike.

Pronotum about 1.1 times as wide as long; widest at base, sides arcuately converging toward rather narrowly rounded anterior margin; anterior margin armed by eight serrations, lateral ones very small; summit behind middle, rather prominent; anterior area with rather coarse asperities; posterior and lateral areas finely, closely granulate-punctate; vestiture consisting of rather short hair, intermixed on posterior half with small scales.

Elytra about 1.2 times as long as wide, 1.4 times as long as pronotum; basal margins with fine raised line, sides straight and subparallel on basal two-thirds, rather broadly rounded behind; striae and strial punctures obscure; surface finely, closely punctured. Declivity convex, not steep. Vestiture consisting of groundwork of small abundant scales, and rows of rather long stout bristles.

Male: Similar to female except frons convex to epistomal margin, with a small median epistomal impression, epistomal margin overlapping inner margin of mandibles; vertex with a rather long, sharply elevated transverse carina, moderately impressed above carina, surface almost smooth and imperceptibly punctured; summit of pronotum nearer base, asperities smaller.

DISTRIBUTION: Philippine and western Caroline Is.

PALAU. BABELTHUAP: One, wooded peak southwest of Ulimang, beating vegetation, Dec. 1947, Dybas. PELELIU: One, Jan. 1948, Dybas.

YAP. YAP: One, July 1951, Gressitt.

This species may be recognized by the small size, by the small, scalelike vestiture on the anterior as well as the posterior areas of the elytra and on the posterior areas of the pronotum, by the rows of stout, long interstrial hairs, and by the sculpture of the head.

Genus **Hypocryphalus** Hopkins

Hypocryphalus Hopkins, 1915, U. S. Dept. Agric., Rept. **99**: 41 (type: *H. rotundus*).

Dacryphalus Hopkins, 1915, U. S. Dept. Agric., Rept. **99**: 42.

This genus is represented by several species in southeastern Asia, the East Indies, Australia, and eastward to the Samoan Islands. One species has been introduced, in recent years, into most other tropical and subtropical areas of the world.

17. **Hypocryphalus mangiferae** (Stebbing).

Cryphalus mangiferae Stebbing, 1914, Indian Forest Insects, 542.

Hypocryphalus mangiferae Eggers, 1928 (not Stebbing, 1914), Inst. Biol. São Paulo, Archiv. **1**: 85.

Hypocryphalus mangiferae, Beeson, 1929, Insects of Samoa **4** (4): 226.—Wood, 1954, Univ. Kansas Sci. Bull. **36**: 999.

Female: Length 1.6-1.9 mm., about 2.2 times as long as wide; body dark yellowish brown.

Frons convex, flattened toward epistoma; surface subaciculate, reticulate above frons, punctured at sides and above; vestiture fine, inconspicuous. Eye narrowly, rather deeply emarginate; finely granulate. Antennal funicle five-segmented; club large, subcircular, slightly longer than scape, with three procurved sutures indicated by rows of setae.

Pronotum about 1.1 times as wide as long; sides widest near base, convergently arcuate toward rather narrowly rounded anterior margin; anterior margin armed by four (rarely

three or five) teeth of moderate size, median pair slightly larger, closely placed, lateral ones separated by a distance at least equal to basal width of one tooth; summit rather indefinite, behind middle; asperate in front of summit, asperate area closely, finely punctured; posterior and lateral areas uniformly, closely, finely granulate; pubescence consisting of abundant, rather short, fine recumbent hair, and a few longer erect bristles.

Elytra dull, not shining; striae impressed, punctures obscure, not impressed; interstriae two to three times as wide as striae, covered with closely placed, minute, confused granules, intermixed with a few minute, shallow punctures; each granule bearing a seta. Declivity convex, not steep. Vestiture consisting of abundant, short, coarse, recumbent interstrial and strial hair, and uniseriate rows of long slender, hairlike interstrial bristles.

Male: Similar to female except posterior margin of abdominal segment 5 more broadly rounded.

DISTRIBUTION: India, Madagascar, North and South America, Hawaiian, Samoan, and western Caroline Is.

PALAU. KOROR: One, Mar. 1948, Maehler.

Genus **Cryphalomorphus** Schaufuss

Lepicerus Eichhoff, 1878 (1879; not Motschulsky, 1855), Soc. Roy. Sci. Liége, Mém. II, **8**: 476, 501.

Cryphalomorphus Schaufuss, 1891, Tijdschr. Ent. **34**: 12 (type: *C. communus*).—Hagedorn, 1910, Coleopt. Cat. **4**: 46; 1910, Genera Insectorum **111**: 83.—Wood, 1954, Univ. Kansas Sci. Bull. **36**: 996.

Letznerella Reitter, 1913, Wiener Ent. Zeitung **32**: 68.

Hypothenoides Hopkins, 1915, U. S. Dept. Agric., Rept. **99**: 11.

Ernoporides Hopkins, 1915, U. S. Dept. Agric., Rept. **99**: 34.

Neocryphalus Eggers, 1922, Ent. Blätter **18**: 169.

Lepicerinus Hinton, 1936, Ann. Mag. Nat. Hist. X, **17**: 473.—Schedl, 1940, Münchner Ent. Gesell., Mitt. **30**: 587.

This genus is known from most of the tropical and subtropical areas of the world; more than a third of the known species occur in the southwestern Pacific area.

Key to Micronesian Species of Cryphalomorphus

1. Pronotum punctured behind summit (a few minute granules just behind summit in *C. nanulus*); elytral interspaces smooth and shining, with uniseriate rows of fine punctures; body stout, small 2
   Pronotum granulate behind summit; elytral interspaces granulate, at least toward declivity; body form more slender 4
2. Pronotum with a few fine rounded granules just behind summit, posterior area very closely, rather coarsely punctured; interstrial punctures on disc deeper, apparently more abundant; declivital vestiture consisting of rows of erect bristles and more abundant minute interstrial scales; frons with short, rather obscure transverse carina .... **20. nanulus**
   Pronotum entirely devoid of granules behind summit, posterior area rather finely, sparsely punctured; interstrial punctures rather obscure; declivital vestiture consisting only of rows of erect bristles; frons without transverse elevation 3

3. Pronotum smooth and shining behind summit, with fine, sparse punctures; elytral vestiture hairlike; frons rather strongly impressed just below upper level of eyes..**18. pacificus**
   Pronotum reticulate behind summit, with moderately fine punctures; elytral vestiture scalelike; frons not conspicuously impressed........................**19. pumilus**
4. Pronotum punctured along base (for one-eighth of length); elytral striae impressed, particularly 1, interstriae without granules on basal third of disc; lateral margin of pronotum with a fine raised line on more than basal half; smaller, length 1.2 mm..**21. basilaris**
   Pronotum without punctures behind summit (rarely a few on basal margin); elytral striae not impressed, interspaces with granules to base; lateral margin of pronotum with fine raised line visible on less than basal third; larger than 1.3 mm. 5
5. Pronotum reticulate behind summit and with rather sparse rounded granules of moderate size; elytral interspaces with uniseriate rows of rather widely spaced fine granules, strial punctures small, separated by smooth spaces about equal to their diameters..**22. nubilus**
   Pronotum closely granulate, setiferous granules craterlike and isolated from one another except laterally, elytral interspaces with close similar granules; strial punctures narrowly separated by smaller setiferous granules........**23. granulatus**

18. **Cryphalomorphus pacificus** (Schedl).

Leperisinus pacificus Schedl, 1942, Münchner Ent. Gesell., Mitt. **32**: 176.
Cryphalomorphus pacificus, Schedl, 1952, Dusenia **3**: 345.

Female: Length 1.2-1.3 mm., 2.3 times as long as wide; color very dark brown.

Frons rather strongly impressed at center, more or less flattened below impression, rather strongly convex above; surface reticulate above, and finely punctured above and below; vestiture inconspicuous.

Pronotum about equal in length and width; sides almost straight and subparallel on basal half, rather narrowly rounded in front; anterior margin armed by two widely separated teeth (rarely three or four); summit at middle; anterior area finely asperate; posterior and lateral areas smooth and shining, with fine, rather sparse punctures; short vestiture visible only in asperate area.

Elytra about 1.4 times as long as wide, 1.4 times as long as pronotum; sides almost straight and subparallel on basal two-thirds, rather broadly rounded behind; only striae 1 impressed, more strongly near base, strial punctures rather small and deep; interstriae wider than striae, smooth and shining, each with a row of very fine punctures. Declivity steep, convex; interstrial punctures more conspicuous, very finely granulate. Vestiture consisting of rows of erect interstrial hairs, very fine on disc, rather stout on declivity.

Male: Similar to female in all respects.

DISTRIBUTION: S. Mariana and western Caroline Is.

S. MARIANA IS. GUAM: One, June 1945, Stuntz; one, Mt. Alifan, Apr. 1946, Krauss.

PALAU. BABELTHUAP: One, Ulimang, in twigs of tree, Dec. 1947, Dybas. PELELIU: One, Aug. 1945, Hagen; one, west coast, Jan. 1948, Dybas.

YAP. YAP: One, Oct. 1952, Krauss.

TRUK. WENA (Moen): One, Nantaku, Mar. 1949, Potts; one, Mt. Chukumong, Feb. 1953, Gressitt.

The impressed frons, the smooth, shining surface of the elytral disc and the posterior areas of the pronotum, the absence of interstrial granules, and the

hairlike pubescence distinguish this species from the other Micronesian representatives of the genus.

19. **Cryphalomorphus pumilus** Wood, n. sp.

Female: Length 1.1 mm., 2.2 times as long as wide; color brown.

Frons evenly convex from epistoma to vertex, surface reticulate and sparsely, rather coarsely punctured; vestiture inconspicuous.

Pronotum about equal in length and width; sides almost straight and subparallel on basal half, rather narrowly rounded in front; anterior margin armed by six serrations, median pair somewhat larger; summit at middle; anterior area finely asperate; posterior and lateral areas dull, reticulate, rather coarsely, sparsely punctured; short vestiture visible only in asperate area.

Elytra about 1.4 times as long as wide, 1.4 times as long as pronotum; sides almost straight and subparallel on basal two-thirds, rather broadly rounded behind; striae not impressed, punctures rather large and deep; interstriae narrower than striae, rather smooth and shining, punctures fine, rather indistinct, in uniseriate rows. Declivity steep, convex; striae and interstriae narrower than on disc, interstrial punctures very feebly granulate. Vestiture consisting of rows of erect, rather widely spaced, interstrial scales, each scale about four to five times as long as wide; scales almost entirely confined to declivital area.

Male: Unknown.

Holotype, female (CM), northwest slope, Mt. Lasso, Tinian, beating vegetation, May 4, 1945, Dybas.

DISTRIBUTION: S. Mariana Is. (Tinian).

This species is readily distinguished from other Micronesian representatives of the genus by the convex frons, by the reticulate and punctured posterior and lateral areas of the pronotum, by the rather smooth and finely punctured elytral interspaces, and by the scalelike elytral bristles.

20. **Cryphalomorphus nanulus** Wood, n. sp.

Female: Length 1.2 mm. (paratypes 1.1-1.3 mm.), about 1.3 times as long as wide; color dark brown.

Frons convex, moderately impressed just above epistomal margin, with a rather obscure, short, transverse elevation above impression; surface reticulate, rather coarsely and closely punctured; vestiture inconspicuous.

Pronotum about equal in length and width; sides almost straight and subparallel on basal half, rather narrowly rounded in front; anterior margin armed by eight serrations of about equal size; summit at middle, anterior area rather finely asperate; posterior areas with a few very fine rounded granules immediately behind summit, deeply, closely, rather coarsely punctured in remaining areas; vestiture short, hairlike.

Elytra about 1.4 times as long as wide, 1.4 times as long as pronotum; sides almost straight and subparallel on basal two-thirds, rather broadly rounded behind; striae not impressed, punctures rather large and deep; interstriae as wide as striae, rather smooth and shining, punctures fine, rather deep, very close, in rather definite rows. Declivity steep, convex; striae and interstriae narrower than on disc, striae more strongly impressed, interstrial punctures feebly granulate. Vestiture consisting of moderately abundant minute interstrial scales on declivity; and rows of longer, erect, interstrial setae on both disc and declivity, becoming scalelike on declivity, each scale about four times as long as wide.

Male: Similar to female in all respects, except slightly smaller.

Holotype, female (CM), Mt. Tagpochau, Saipan, 375 m., Feb. 18, 1945, Dybas; allotype, male (CM), same data. Paratypes (CM, CNC, BISHOP):

Nine, same data as for holotype; three, Mt. Lasso, northwest slope, Tinian, beating vegetation, Mar. 17, 1945, Dybas; one, Mt. Lasso, northwest slope, Tinian, Apr. 13, 1945, Dybas.

DISTRIBUTION: S. Mariana Is. (Saipan, Tinian).

This species appears to be more closely allied to *Cryphalomorphus pumilus* than to other known representatives of the genus but is readily distinguished by the finely raised transverse line on the frons, by the deeply, closely punctured posterior areas of the pronotum, and by the presence of fine interstrial scales in addition to the usual rows of long erect bristles.

21. **Cryphalomorphus basilaris** Wood, n. sp.

Female: Length 1.2 mm., 2.5 times as long as wide; color very dark brown.

Frons feebly convex; surface reticulate above eyes, shining below, deeply, finely, rather closely punctured; vestiture inconspicuous.

Pronotum 1.16 times as long as wide; sides weakly arcuate, not converging on basal half, narrowly rounded in front; anterior margin armed by about ten small serrations; indefinite summit in front of middle; anterior area rather finely, closely asperate; area behind summit with numerous, large, close, rounded, obscurely punctate granules, except deeply, rather closely punctured basally, punctured area occupying about one-eighth length of pronotum, becoming more extensive laterally.

Elytra 1.45 times as long as wide, 1.3 times as long as pronotum; sides straight and subparallel on basal two-thirds, rather broadly rounded behind; striae 1 rather strongly, the others weakly, impressed, punctures small and rather deep; interstriae as wide as striae, punctures rather large, sparse, becoming granulate posteriorly. Declivity steep, convex; interstriae each with row of rather close, fine granules. Vestiture consisting of rows of long slender interstrial hairs, rather coarse, but pointed on declivity.

Male: Unknown.

Holotype, female (US 64628), Koror, Palau, sweeping, Mar. 10, 1954, Beardsley.

DISTRIBUTION: Caroline Is. (Palau).

This species may be readily distinguished from the other Micronesian representatives of the genus by the small size and slender shape, by the unusual sculpture of the pronotum, by the impressed elytral striae, and by the long, hairlike elytral vestiture.

22. **Cryphalomorphus nubilus** Wood, n. sp.

Female: Length 1.6 mm. (paratypes 1.5-1.6 mm.), 2.5 times as long as wide; head black, pronotum very dark brown, elytra and legs somewhat lighter shade of brown, antennae yellowish brown.

Frons convex, broadly impressed above epistoma, median line above eyes broadly, indistinctly raised; surface reticulate, with fine punctures below; vestiture inconspicuous.

Pronotum 1.1 times as wide as long; widest on basal third, sides arcuately convergent toward rather narrowly rounded anterior margin; anterior margin armed by seven (normally six) serrations of moderate size; summit at middle, broadly impressed behind summit, anterior area rather coarsely asperate; surface reticulate, rather sparsely, finely granulate behind summit, becoming more nearly punctate laterally; vestiture rather short, sparse, hairlike.

Elytra 1.6 times as long as wide, 1.8 times as long as pronotum; sides straight and subparallel on basal two-thirds, rather broadly rounded behind; striae not impressed, punc-

tures small, close, spaces between them smooth; interstriae wider than striae, punctures in rows and equal in size and abundance to those of striae, anterior margin of each puncture raised, forming a small granule. Declivity convex, rather steep; all punctures and granules reduced in size as compared to those of disc. Vestiture consisting of minute strial hair; and erect uniseriate rows of interstrial bristles, coarser and bluntly pointed on declivity.

Male: Similar to female.

Holotype, female (US 64629), Ine I., Arno Atoll, Marshall Is., from dead *Scaevola* sp., June 17, 1950, Usinger; allotype, male (US), Pukusrik, Kusaie, beating, May 2, 1953, Clarke. Paratypes (US, CNC, BISHOP), Caroline Atolls: Two, Hare I., Kapingamarangi Atoll, from *Scaevola frutescens,* Aug. 3, 1946, Townes. Paratypes, Kusaie: Six, same data as for allotype. Paratypes, Marshall Is.: Three, same data as for holotype; 35, Likiep I., Likiep Atoll, Aug. 30, 1946, Oakley; 12, Ikudon (Igurin) I., Eniwetok Atoll, from *Scaevola frutescens,* May 14, 1946, Townes.

DISTRIBUTION: Eastern Caroline Is. (Kusaie, Kapingamarangi) and Marshall Is. (Arno, Likiep).

HOST: *Scaevola frutescens.*

This species may be readily distinguished from other species of the genus by the finely sculptured frons, by the rather coarsely asperate anterior area and the reticulate, finely, sparsely granulate posterior area of the short pronotum, by the finely granulate coarse interstrial punctures, and by the hairlike vestiture of the pronotum and elytra.

23. **Cryphalomorphus granulatus** Wood, n. sp.

Male: Length 1.4 mm. (paratypes 1.38-1.47 mm.), 2.5 times as long as wide; pronotum very dark brown, elytra brown.

Frons feebly convex; more nearly flattened below; surface rather coarsely, closely granulate-punctate, reticulate above; vestiture inconspicuous. Septum of antennal club less strongly oblique than usual for the genus, arrangement of vestiture giving appearance of arcuate suture extending to inner margin.

Pronotum slightly (1.05 times) longer than wide; widest a third of distance from base, sides arcuate on basal half, narrowly rounded in front; anterior margin armed by six serrations of moderate size; summit rather indefinite, anterior to middle; surface densely covered by close, rather coarse, isolated granules, those on anterior slope more sharply pointed, craterlike behind summit; vestiture short, hairlike.

Elytra 1.4 times as long as wide, 1.4 times as long as pronotum; sides straight and subparallel on basal half, rather broadly rounded behind; striae weakly impressed, punctures small and rather deep with each space between punctures bearing a small granule; interstriae wider than striae, closely, rather coarsely, uniseriately granulate, each granule punctured on its posterior slope. Declivity rather steep, convex; granules somewhat smaller. Vestiture hairlike, short, rather abundant, coarser on declivity.

Female: Similar to male.

Holotype, male (CM), Kalabera area, Saipan, S. Mariana Is., Jan. 28, 1945, Dybas; allotype, female (CM), same data. Paratypes (CM, US, CNC, BISHOP): Nine, same data as for holotype; 24, Marpi Point, Saipan, from *Cerbera manghas,* June 28, 1946, Townes.

DISTRIBUTION: S. Mariana Is. (Saipan).

HOST: *Cerbera manghas.*

This species is readily distinguished from other species of the genus by the densely, rather coarsely granulate pronotum, by the closely, rather coarsely granulate elytral interspaces, and by the presence of small setiferous granules in the spaces between the punctures of the elytral striae. The septum in the antennal club is more nearly transverse and perhaps slightly longer than is usual in the genus.

Genus **Eidophelus** Eichhoff

Eidophelus Eichhoff, 1875, Soc. Ent. Belgique, Ann. **18**: 200 (type: *E. imitans*); 1878 (1879), Soc. Roy. Sci. Liége, Mém. II, **8**: 49, 203, 473.—Blandford, 1894, Ent. Soc. London, Trans. **1894**: 88.—Hagedorn, 1910, Coleopt. Cat. **4**: 69; 1910, Genera Insectorum **111**: 89.

Two species, both from Japan, have been described previously in this genus. They superficially resemble certain species of *Pityophthorus* by the sexually dimorphic frons, by the slender, subglabrous body form, and by the conspicuous, fine, basal and lateral raised lines on the pronotum; however, they are entirely unrelated to that genus. The true affinity is with the Cryphalini, evidently near *Cryphalomorphus*. A conspicuous character found in the genus is the fine raised line along the elytral bases similar to that found on the basal and lateral margins of the pronotum in this genus, in most of the Cryphalini, and in the Pityophthorini. This elytral character also appears in some species of allied genera, but is usually not so well developed.

Key to Micronesian Species of Eidophelus

1. Pronotum dull, posterior area finely rugose-reticulate with a few very minute granules; elytral surface more coarsely sculptured, interspaces irregular .... **24. incomptus**

   Pronotum shining, posterior area finely reticulate, rather deeply and closely punctured; elytra more finely sculptured, interspaces smooth 2

2. Strial punctures larger, more deeply impressed; interstriae evidently impunctate; larger, 1.4 mm. .... **25. argutus**

   Strial punctures smaller, rather shallow; interstriae minutely, closely and rather irregularly punctured; smaller, 1.1 mm. .... **26. atomus**

24. **Eidophelus incomptus** Wood, n. sp.

Female: Length 1.4 mm., about 2.9 times as long as wide; pronotum dull black, elytra brown.

Frons feebly convex, rather strongly impressed above epistoma; central area dull, impunctate, and glabrous, marginal areas along epistoma, sides and above very finely, rather closely punctured; punctured area at sides and above, except medially, bearing long white hair, a few shorter inconspicuous setae on epistomal margin. Eye and antenna similar to those of *E. argutus.*

Pronotum 1.1 times as long as wide; sides almost straight and subparallel on basal half, rather broadly rounded in front; anterior margin armed by about 12 to 14 small

serrations; dorsal impression at middle feebly indicated, anterior one-fourth declivous; declivous area with fine, isolated, confused asperities; surface rather coarsely rugose-reticulate, dull, posterior and lateral areas with a few minute shining points, evidently indicating presence of fine granules; vestiture fine, short, sparse, and hairlike, minute except on asperate area.

Elytra about 1.9 times as long as wide; sides straight and subparallel on basal three-fourths; basal and costal margins with finely raised line; striae not impressed, the punctures of moderate size and depth, partly obscured by irregular interspaces; interstriae narrower than striae, more or less crenulate, evidently finely punctured, punctures obscured by irregular surface. Declivity steep, convex; strial punctures reduced, scarcely distinguishable from what appear to be equally large interstrial punctures. Vestiture largely confined to posterior part of disc and declivity, consisting of erect, slender scales, and very minute strial hairs; sparse scales extend anteriorly on interspaces 3 and 5 almost to elytral base.

Male: Similar to female except frons without long white hair.

Holotype, female (CM), Iwo Jima, Volcano Is., Nov. 1, 5, 1945, Dybas; allotype, male (CM), same data.

DISTRIBUTION: Volcano Is. (Iwo Jima).

This species is similar to *Eidophelus argutus,* but has entirely different surface sculpture. The frontal vestiture of the female is less conspicuous, the pronotum appears dull, its surface is rugose-reticulate, at first appearing very finely and closely granulate, and the elytral surface is more coarsely sculptured.

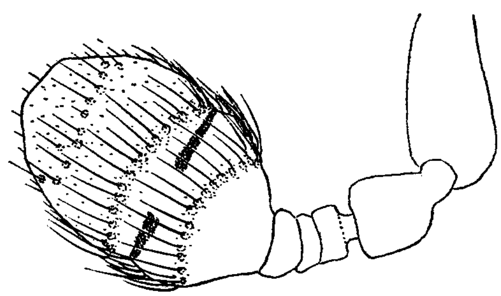


FIGURE 7.—*Eidophelus argutus,* anterior face, right antenna.

25. **Eidophelus argutus** Wood, n. sp. (fig. 7).

Female: Length 1.4 mm., 2.7 times as long as wide; body very dark brown, almost black, antennae and legs brown.

Frons flattened, gradually raised toward epistoma, epistomal area slightly higher medially; surface at center dull, impunctate, and glabrous, marginal area along epistoma, sides, and above closely, rather deeply, finely punctured; punctured area at sides and above, except on a narrow median space, bearing long yellow hair, a few shorter inconspicuous setae on epistomal margin. Eye about 2.4 times as long as wide, sinuate on anterior margin, narrower on lower half; finely granulate. Antennal scape long; funicle four-segmented; club oval, three sutures visible on anterior face, the first septate.

Pronotum 1.05 times as long as wide; widest at base, sides almost straight, converging slightly, semicircularly rounded in front; anterior margin armed by about eight to ten small serrations; dorsally constricted at middle, declivous on anterior one-fourth, declivous

area armed by numerous, fine, isolated, confused asperities; surface reticulate, posterior and lateral areas finely, sparsely punctured, punctures a little larger and deeper medially at base; vestiture consisting of a few short hairs in asperate area, glabrous behind.

Elytra 1.6 times as long as wide; sides straight and subparallel on basal two-thirds, rather broadly rounded behind; basal margins with fine raised line extending from small scutellum to costal margin, continuing along costal margin to elytral apex; striae not impressed, punctures rather large, deep, close; interstriae much narrower than striae, appearing smooth and shining, but with obscure irregular lines interrupting the surface. Declivity steep, convex; strial punctures reduced in size and depth; interstriae finely punctured, margins of a few punctures indistinctly elevated. Vestiture consisting of sparse, erect, interstrial scales on declivity and continuing on disc on interspaces 3 and 5; each scale flattened only on distal half.

Male: Similar to female except frons without long yellow hair.

Holotype, female (CM), Saipan, S. Mariana Is., Dec. 31, 1944, Dybas; allotype, male (CM), same data. Paratypes (CM, CNC, BISHOP): Eight, same data as for holotype; one, Kalabera area, Saipan, Feb. 16, 1945, Dybas.

DISTRIBUTION: S. Mariana Is. (Saipan).

This species is evidently closely allied to *Eidophelus imitans* Eichhoff, but may be distinguished by the smaller size, by the more finely punctured posterior and lateral areas of the pronotum, and by the absence of tubercles on the elytral declivity.

26. **Eidophelus atomus** Wood, n. sp.

Male: Length 1.1 mm., about 2.7 times as long as wide; color very dark brown, almost black.

Frons convex, surface reticulate and finely punctured; epistoma rather deeply emarginate on median third; vestiture sparse, short, inconspicuous. Eye and antenna similar to *E. argutus.*

Pronotum 1.06 times as long as wide; widest near base, sides almost straight, converging slightly, semicircularly rounded in front; anterior margin armed by a continuous, rather sharply and strongly elevated, costate ridge; dorsally constricted at middle, declivous on anterior fourth, declivous area armed by numerous, fine, confused asperities; surface reticulate, posterior and lateral areas rather coarsely and closely punctured; vestiture inconspicuous.

Elytra 1.7 times as long as wide; sides straight and subparallel on basal two-thirds, rather broadly rounded behind; basal margins with a fine raised line extending from small scutellum to costal margin, continuing along costal margin to elytral apex; striae not impressed, punctures rather small, shallow, moderately close; interstriae about as wide as striae, smooth and shining with numerous minute, close punctures in semidefinite rows. Declivity steep, convex; each interspace armed by a row of rather large granules. Vestiture consisting of sparse, erect, interstrial scales on declivity; each scale flattened on more than distal half.

Female: Unknown.

Holotype, male (US 64630), Kolonia (Yaptown), Yap, Yap Is., July 13, 1946, Townes.

DISTRIBUTION: Western Caroline Is. (Yap).

This species is rather closely allied to *Eidophelus argutus* but is readily distinguished by the smaller size, by the smaller, less deeply impressed strial punctures, by the presence of numerous, very minute interstrial punctures, and, in the male, by the emarginate epistoma.

Genus **Stephanoderes** Eichhoff

Stephanoderes Eichhoff, 1871, Berliner Ent. Zeitschr. **15**: 132.—Hagedorn, 1910, Coleopt. Cat. **4**: 40 (subgenus *Cryphalus*); 1910, Genera Insectorum **111**: 84 (subgenus *Cryphalus*).—Hopkins, 1915, U. S. Dept. Agric., Rept. **99**: 21.—Wood, 1954, Univ. Kansas Sci. Bull. **36**: 1015.

The species of this genus are found in virtually all tropical and subtropical parts of the world. In general, they are polyphagous twig borers, although they are commonly found in berries, stems of herbaceous plants, or other unusual places. Because of their habits they are readily transported through commerce. One Micronesian species is a serious pest of coffee.

Key to Micronesian Species of Stephanoderes

1. Frons without median groove or impression; anterior margin of pronotum armed by four serrations, median pair much larger; vestiture on elytral declivity usually with groundwork of small interstrial scales in addition to usual strial hair and rows of erect interstrial scales; averaging larger, 1.4-2.2 mm. .... **27. birmanus**
   Frons with median groove or impression; anterior margin of pronotum armed by four or more serrations of about equal size; interstrial vestiture consisting only of uniseriate rows of erect setae; smaller, 1.0-1.8 mm. 2
2. Frons with a distinct elevation at upper level of eyes, a groove or impression extending from summit of elevation about one-fourth to three-fourths of distance to epistoma, slightly concave longitudinally between summit of elevation and epistomal margin........ **29. hivaoea**
   Frons convex, at least not longitudinally concave on lower half, without median elevation 3
3. Declivital bristles slender, blunt; anterior margin of pronotum normally armed by four serrations; mature color black; larger, 1.5-1.8 mm........ **28. hampei**
   Declivital bristles scalelike, less than three times as long as wide; anterior margin of pronotum normally armed by six serrations; mature color brown; smaller, 1.4-1.5 mm. .... **30. georgiae**

27. **Stephanoderes birmanus** (Eichhoff).

Triarmocerus birmanus Eichhoff, 1878 (1879), Soc. Roy. Sci. Liége, Mém. II, **8**: 486.

Stephanoderes alter Eggers, 1923, Zool. Meded. Roy. Mus. Nat. Hist. Leyden **7**: 219 (n. syn.).

Stephanoderes pacificus Beeson, 1940, B. P. Bishop Mus., Occ. Papers **15** (18): 197 (n. syn.).

Stephanoderes vafer, Beeson, 1940, B. P. Bishop Mus., Occ. Papers **15** (18): 198.

Cosmoderes birmanus, Schedl, 1942, B. P. Bishop Mus., Bull. **172**: 148.

Stephanoderes castaneus Wood, 1954, Univ. Kansas Sci. Bull. **36**: 1027 (n. syn.).

Female: Length 1.4-2.2 mm., 2.3 times as long as wide; color yellowish brown to dark reddish brown.

Frons weakly convex above, somewhat flattened and very finely aciculate below; punctures on lower half moderate in size, depth, and density; pubescence inconspicuous. Antennal funicle variable, with three, four, or five segments, occasionally with a different number of segments in right and left antennae of one specimen.

Pronotum about 1.2 times as wide as long; widest one-fourth of length from base, sides rather strongly arcuate, broadly rounded in front; four contiguous serrations on anterior margin, median pair large, lateral pair minute; about 16 to 22 rather large, distinct asperities on anterior slope; vestiture consisting of rather sparse, short hair, longer on asperate area, intermixed on posterior half with equally long, scalelike setae.

Elytra shining, 1.5 times as long as wide, 1.8 times as long as pronotum; striae not impressed, punctures small; interstriae about 2.5 times as wide as striae, punctures minute, shallow, rather abundant and confused. Declivity rather steep, convex. Vestiture consisting of moderately abundant, small, inconspicuous, hair- or scalelike interstrial setae (often abraded), and uniseriate rows of long, broad, truncate, interstrial scales, each scale on declivity about two to three times as long as wide and almost as long as the distance between rows of bristles, more slender on disc; rows of scales crowded in some specimens and confused on declivity.

Male: Similar to female except smaller, 1.3-1.5 mm., 2.16 times as long as wide; eye reduced in size; serrations on anterior margin of pronotum reduced, often with one or more absent; and elytral vestiture somewhat longer, particularly on sides.

DISTRIBUTION: North America, Africa, Indo-Malayan Region, S. Mariana and Caroline Is.

S. MARIANA IS. SAIPAN: One, beating vegetation, May 1945, 22, As Mahetog area, Nov. 1944, Dec. 1944, mango tree, Jan., Feb. 1945, sweeping at dusk, Apr. 1945, beating vegetation, and May 1945, four, hills east of Garapan, Jan. 1945, one, near Garapan, Jan. 1945, two, Halaihai-As Teo area, Jan. 1945, one, Kalabera area, Jan. 1945, beating vegetation, 14, Laulau Bay, Dec. 1944, one, Mt. Tagpochau, Jan. 1945, beating vegetation, one, Papago area, Jan. 1945, beating vegetation, seven, Talofofo ridge, Jan. 1945, all by Dybas. TINIAN: Seven, Mar. 1945, 12, ridge, southeast section, Mar. 1945, two, Lake Hagoi, Apr. 1945, two, Marpo Valley, Apr. 1945, 23, Mt. Lasso, Mar., Apr. 1945, and one, Tinian Harbor, beating vegetation, Mar. 1945, all by Dybas. ROTA: One, Oct. 1945, Necker. GUAM: One, June 1945, Stuntz; six, Amantes Pt., May 1945, one, Pt. Oca, May 1945, two, Agana, June 1945, two, 2 km. southeast of Asan, 180-240 m., Oct. 1947, four, Fadang, May 1945, two, Pati Pt., June 1945, all by Dybas.

PALAU. One, southern part, Sept. 1945, Ducoff; six, north central part, Aug. 1945, Dybas. KOROR: One, Jan. 1954, Beardsley.

YAP. YAP: Five, July-Aug. 1950, Goss.

TRUK. TON: One, Mt. Unibot, 390 m., Jan. 1953, Gressitt; three, same data, 32 m., Jan. 1953, and one, 200 m., Dec. 1952.

PONAPE. One, Colonia-Net, Nov. 1937, and three, Palikir-Rohnkiti, July 1939, all Esaki; one, southeast Nanpohnmal, light trap, Jan. 1953, Gressitt.

KUSAIE. One, Hill 541, 165 m., Mar. 1953, Clarke; one, Malem River, 30 m., Mar. 1953, Clarke.

This species is very closely allied to *Stephanoderes maculicollis* (Sharp) from the Hawaiian Islands, but is larger and has longer, more slender declivital scales. Both forms have a variable number of segments in the antennal funicle; it is not at all unusual to find a specimen with a different number of segments in the left and right antennae, or to find an incompletely divided segment. This species differs from other Micronesian species by the larger size, by the smaller number and larger size of the asperities on the anterior slope of the pronotum, by the proportionately larger size of the median pair of serrations on the anterior margin of the pronotum, and by the presence of a groundwork of small interstrial scales in addition to the rows of longer, erect scales.

Schedl (1942, B. P. Bishop Mus., Bull. **172**: 148) reported two specimens of this species from Guam that he compared to Eichhoff's type. One of Schedl's specimens, a series of cotypes of *S. alter* in the Eggers collection at Washington, D. C., a series of Malayan and African (presumably from the Congo) specimens examined by Eggers, one specimen each of Beeson's series of *S. pacificus* and *S. vafer,* and numerous specimens, reported as *S. castaneus,* from Florida were examined, in addition to the Micronesian material. All of these specimens appear to represent one species. Aside from variation in segmentation of the antennal funicle, the only variation worthy of note was that of a single Malayan specimen measuring 2.2 mm. in length but otherwise identical with other specimens from the same locality measuring 1.8 mm. or less.

The Hawaiian *S. maculicollis* differs from this species only in size and in length and shape of the elytral scales; perhaps it is no more than an island subspecies of *birmanus*. Further consideration of this problem should await the introduction of this species into the Hawaiian Islands. The recent introduction of this species into Florida and Africa, and evidently other areas, leads one to believe this introduction into the Hawaiian Islands should already have occurred, since other species with similar habits are now known from there; however, specimens have not yet been reported.

28. **Stephanoderes hampei** (Ferrari).

Cryphalus hampei Ferrari, 1867, Die Forst.-und Baumzuchtschädlichen Borkenkäfer, 11.

Stephanoderes hampei, Eichhoff, 1878 (1879), Soc. Roy. Sci. Liége, Mém. II, **8**: 153.—Leefmans, 1923, Meded. Inst. Plantenziekt Buitenzorg **57**: 1-94 (biology).—Corbett, 1933, Malayan Agric. Jour. **21**: 8-22 (biology).

Stephanoderes coffeae Hagedorn, 1910, Ent. Blätter **6**: 1; 1912, Ent. Blätter **8**: 40.

Female: Length 1.5-1.8 mm., 2.2 times as long as wide; color almost black.

Frons convex above, a weak, broad, transverse impression just above epistoma; a fine median groove extending from upper level of eyes about two-thirds of distance toward epistomal margin; surface rugose-reticulate, with fine punctures on lower half.

Pronotum about 1.1 times as wide as long; widest about one-third of distance from base, sides arcuate, rather broadly rounded in front; anterior margin armed by four serrations of equal size, occasionally with additional pair of small granules; asperities rather small, numerous; posterior areas reticulate, laterally punctured, becoming granulate dorsally behind summit; vestiture short, hairlike, intermixed with a few scales on posterior half.

Elytra 1.5 times as long as wide, 1.7 times as long as pronotum; striae indistinctly impressed, punctures moderately large, rather deep; interstriae slightly wider than striae, punctures rather small, evenly spaced in uniseriate rows. Declivity steep, convex; striae and interstriae slightly narrower than on disc. Vestiture consisting of minute, inconspicuous strial hair, and uniseriate rows of erect, flat, slender (not scalelike) bristles.

Male: Similar to female except smaller (about 1.1-1.3 mm.); eye reduced in size; one or more serrations may be absent from anterior margin of pronotum; declivity not as steep; and elytral pubescence longer.

DISTRIBUTION: Virtually all areas of the world where coffee is grown.

S. MARIANA IS. SAIPAN: Four, Mt. Tagpochau, 375 m., Feb. 1945, Dybas.

PONAPE. Three, Agric. Exper. Sta., Colonia, in ripe coffee berries, Jan. 1953, Gressitt; two, Sept. 1950, Adams.

This species is readily distinguished from other Micronesian representatives of the genus by the black color, by the presence of a narrow, median, frontal groove, and by the slender, elytral bristles, not scalelike.

This species is an important pest of coffee; it is usually collected from the infested beans.

29. Stephanoderes hivaoea Beeson.

Stephanoderes hivaoea Beeson, 1935, B. P. Bishop Mus., Bull. **142**:105; 1938, Federated Malay States Mus., Jour. **18**:290.

Stephanoderes hawaiiensis Schedl, 1941, Hawaiian Ent. Soc., Proc. **11** (1): 112 (n. syn.).

Stephanoderes lebronneci, Schedl, 1941, Hawaiian Ent. Soc., Proc. **11** (1): 111.

Female: Length 1.4-1.6 mm., 2.3 times as long as wide; color dark brown.

Frons convex, distinctly elevated medially at upper level of eyes, varying from a tubercle to a very short transverse carina; a median groove, varying from very narrow to rather broad, extending from summit of elevation about one-fourth to three-fourths of distance toward epistomal margin; indistinctly flattened on lower half producing a slight longitudinal concavity between summit of elevation and epistomal margin; surface reticulate, finely, sparsely punctured; vestiture inconspicuous.

Pronotum indistinctly longer than wide (1.02 times); widest on basal third, sides rather weakly arcuate, rather broadly rounded in front; anterior margin armed by six serrations, lateral pair usually smaller; asperities rather small, numerous; lateral areas very finely rugose, finely punctured, punctures become granulate dorsally and to a lesser extent anteriorly; vestiture hairlike, intermixed on posterior areas with longer, rather broad scalelike setae.

Elytra shining; 1.5 times as long as wide, 1.7 times as long as pronotum; striae indistinctly impressed, punctures of moderate size, rather deeply impressed; interstriae slightly narrower than striae, punctures small, subgranulate, squamiferous, evenly spaced in uniseriate rows. Declivity steep, convex; striae more strongly impressed; interstrial punctures

subgranulate. Vestiture consisting of minute, inconspicuous hairlike setae; and uniseriate rows of erect scalelike bristles, each bristle on the declivity about as long as the distance between rows of bristles and two to three times as long as wide, not noticeably longer laterally.

Male: Similar to female except smaller, about 1.0-1.1 mm., 2.2 times as long as wide; eye reduced in size; one or more teeth on anterior margin of pronotum may be absent; declivity not as steep; striae less definite; elytral vestiture much longer and more slender on disc and sides.

DISTRIBUTION: Hawaiian, Marquesas, Bonin, and S. Mariana Is.

BONIN IS. CHICHI JIMA: One, Tatsumi Wan, Apr. 1958, Snyder and Mitchell.

S. MARIANA IS. SAIPAN: One, As Mahetog area, beating vegetation, Apr. 1945, Dybas. TINIAN: Seven, Mar. 1945, Dybas; two, June 1946, Townes; six, Lake Hagoi, June 1946, Oakley; four, Lake Hagoi, beating vegetation, Apr. 1945, Dybas; two, Mt. Lasso, Apr. 1945, Dybas.

This species is very closely allied to *S. obscurus* (Fabricius); as additional data become available, it may be necessary to withdraw Beeson's name. This species differs from other Micronesian representatives of the genus by the presence of a distinctly elevated tubercle or short transverse carina between the eyes, the frons below this point longitudinally concave, and usually with a median groove of varying width.

One series reported by Schedl (1941, op. cit.) from "Oahu: Honolulu, 18-VI-1924, *ex* dead cane," was reported under the name *Stephanoderes lebronneci* on page 111, and on page 112 part of the same series was described as *S. hawaiiensis*; specimens under both names bearing determination labels written by Schedl were examined, compared directly, and found to be identical in every respect with this species.

The species described by Beeson as *S. hivaoea* appears to be almost indistinguishable from the American species, *S. obscurus*. However, the minor variation in the Micronesian series that was described as the distinguishing feature of *hivaoea* (the frontal impression broader and deeper behind) evidently does not occur in either North or South American specimens. Until sufficient material from other parts of the world is available for study, the exact status of these names cannot be determined; however, it seems advisable to consider the Pacific specimens as a distinct species under the name *S. hivaoea* until the problem can be solved.

30. Stephanoderes georgiae Hopkins.

Stephanoderes georgiae Hopkins, 1915, U. S. Dept. Agric., Rept. **99**: 26.—Wood, 1954, Univ. Kansas Sci. Bull. **36**: 1048.

Stephanoderes lebronneci Beeson, 1935, B. P. Bishop Mus., Bull. **142**: 104 (n. syn.); 1938, Federated Malay States Mus., Jour. **18**: 290.

Female: Length 1.4-1.5 mm., 2.4 times as long as wide; body very dark brown.

Frons convex, with median line very feebly raised and usually with a fine median groove extending from upper level of eyes a variable distance toward epistomal margin; surface coarsely reticulate above and on sides below, punctures fine, sparse; vestiture inconspicuous.

Pronotum equal in length and width; widest on basal third, sides arcuate, rather broadly rounded in front; anterior margin armed by six serrations, lateral pair usually smaller; asperities rather small, numerous; lateral areas with rather abundant, moderately large, shallow punctures becoming granulate near asperate area and behind summit to base; vestiture hairlike, intermixed on posterior areas with slightly longer, scalelike setae.

Elytra shining; 1.6 times as long as wide, 1.6 times as long as pronotum; striae indistinctly impressed, punctures moderately large, deep; interstriae slightly narrower than striae, punctures small, subgranulate, squamiferous, evenly spaced in uniseriate rows. Declivity steep, convex; striae and interstriae slightly narrower than on disc. Vestiture consisting of minute, inconspicuous strial hair; and uniseriate rows of erect scalelike bristles, each bristle slightly shorter than distance between rows of bristles and one and a half to two and a half times as long as wide, not noticeably longer laterally.

Male: Similar to female except length 0.8-1.0 mm., 2.2 times as long as wide; eye reduced in size, often with as few as 20 facets; one or more serrations may be absent from anterior margin of pronotum; declivity not as steep; striae less definite; and elytral pubescence longer and more slender, particularly on disc and sides.

DISTRIBUTION: Eastern North America and S. Mariana Is.

S. MARIANA IS. SAIPAN: Five, near Garapan, under bark, Dec. 1944, Dybas. GUAM: One, Fadang, May 1945, Dybas; two, 1 mi. southeast of Asan, 180-240 m., Nov. 1947, Dybas.

This species is allied to *S. hivaoea,* but may be readily distinguished by the smaller average size, and by the evenly convex frons which lacks the median elevation between the eyes.

This species has almost certainly been introduced into both the Mariana Islands and North America. It is undoubtedly known from other parts of the world under another name; unfortunately many of the older species reported from southeastern Asia were not available for study to check suspected synonymy. A paratype of *Stephanoderes lebronneci* was found to be identical with a series of homotypes from North America.

Genus **Hypothenemus** Westwood

Hypothenemus Westwood, 1834, Ent. Soc. London, Trans. 1 (1): 34.—Hagedorn, 1910, Coleopt. Cat. **4**: 40 (subgen. *Cryphalus*); 1910, Genera Insectorum **111**: 84 (subgen. *Cryphalus*).—Hopkins, 1915, U. S. Dept. Agric., Rept. **99**: 12.—Wood, 1954, Univ. Kansas Sci. Bull. **36**: 1050.

Like *Stephanoderes,* the species of this genus are found in virtually all tropical and subtropical parts of the world. For the most part, they are polyphagous twig borers, although they are frequently found in non-woody plants, or unexpected places, for instance, Westwood's type series of *eruditus* that was taken from the cover of an old book.

KEY TO MICRONESIAN SPECIES OF HYPOTHENEMUS

1. Frons rather strongly impressed on lower half, with a rather definite transverse elevation at upper level of eyes; larger, 1.25-1.55 mm................................**31. areccae**
   Frons convex, without a transverse elevation at upper level of eyes; smaller, less than 1.25 mm. 2
2. Interstrial rows of erect setae scalelike on both disc and declivity of elytra....**32. eruditus**
   Interstrial setae scalelike on disc, almost hairlike on declivity..............**33. mangarevanus**

31. **Hypothenemus areccae** (Hornung).

Bostrichus areccae Hornung, 1842, Stett. Ent. Zeitung **3**: 117.

Bostrichus boieldieui Perroud, 1864, Soc. Linn. Lyon, Ann. **1864**: 188.

Stephanoderes fungicola Eggers, 1908, Ent. Blätter **4**: 216.

Hypothenemus basjoo Niisima, 1910, Sapporo Nat. Hist. Soc., Trans. **3**: 9.

Cryphalus areccae, Hagedorn, 1910, Coleopt. Cat. **4**: 40.

Hypothenemus areccae, Hopkins, 1915, U. S. Dept. Agric., Rept. **99**: 14.

Stephanoderes areccae, Eggers, 1922, Ent. Bericht. Amsterdam **6**: 86, 1929, Wiener Ent. Zeitung **46**: 55.

Stephanoderes hispidus Eggers, 1925, Ent. Odd. Nar. Mus. Praze, Sbornik **3**: 156 (n. syn.).

Hypothenemus capitalis Beeson, 1935, B. P. Bishop Mus., Bull. **142**: 102 (n. syn.).

Hypothenemus eupolyphagus Beeson, 1940, B. P. Bishop Mus., Occ. Papers **15** (18): 193 (n. syn.).

Hypothenemus oahuensis Schedl, 1941, Hawaiian Ent. Soc., Proc. **11** (1): 110 (n. syn.).

Female: Length 1.25-1.55 mm., 2.5 times as long as wide; color brown.

Frons with a short transverse elevation at upper level of eyes, moderately impressed below (very similar to some examples of *Stephanoderes hivaoea*); surface reticulate and finely punctate at sides and above elevation, smooth and shining below; vestiture inconspicuous.

Pronotum equal in length and width; widest at base, sides very feebly arcuate and converging on basal half, rather broadly rounded in front; anterior margin armed by six serrations, lateral ones a little smaller; asperities rather coarse and numerous; posterior half reticulate, rather finely punctured laterally, becoming granulate behind summit; vestiture hairlike, intermixed on posterior areas with slightly longer, scalelike setae.

Elytra 1.6 times as long as wide, 1.6 times as long as pronotum; striae indistinctly impressed, punctures moderately large, deep; interstriae slightly wider than striae, punctures minute, rather close, confused. Declivity steep, convex; strial punctures somewhat smaller than on disc. Vestiture consisting of strial and interstrial hair, rather abundant and longer on declivity; and uniseriate rows of erect interstrial scales, each scale rather slender, about 3 to 5 times as long as wide and about as long as hairlike setae.

Male: Similar to female except smaller, about 1.0 mm.; eye reduced in size; one or more serrations may be absent from anterior margin of pronotum; declivity not as abrupt; striae less definite; and elytral pubescence longer.

DISTRIBUTION: Southern Asia, East Indies, Hawaiian, S. Mariana, eastern Caroline, and Marshall Is.

S. MARIANA IS. SAIPAN: Three, Achugau area, May 1945, Dybas; one, As Gonno, May 1942, Matusita; four, As Mahetog area, Nov.-Dec. 1944, Jan. 1945, Dybas; four, near Garapan, Dec. 1944, Dybas; four, Laulau Bay, Dec. 1944, Jan. 1945, Dybas. TINIAN: Three, Mar. 1945, Dybas; one, ridge, southeast section, Mar. 1945, Dybas; seven, Mt. Lasso, Mar., Apr. 1945, Dybas; nine, Tinian Harbor, Mar. 1945, Dybas.

PONAPE. One, Mt. Temwetemwensekir, 150-300 m., beating, Feb. 1948, Dybas.

MARSHALL IS. JALUIT: One, Majurirok, breadfruit, Apr. 1958, Gressitt.

This species is readily distinguished from other Micronesian representatives of the genus by the larger average size and by the presence of a short transverse elevation at the upper level of the eyes, moderately impressed below this elevation.

The Micronesian specimens were identical with specimens in the Eggers collection at the U. S. National Museum labeled *Hypothenemus areccae* by Eggers, and with his series of cotypes of *H. fungicola* and *hispidus*.

Specimens in the collection of the Hawaiian Sugar Planters' Association, from the type locality and bearing Schedl's identification label of *H. oahuensis*, are actually *H. eruditus*. Other specimens bearing the exact data of the second locality listed by Schedl [1941, Hawaiian Ent. Soc., Proc. **11** (1) : 110] fit his description of *H. oahuensis* and are identical with *H. areccae* from other areas of the Hawaiian Islands, Micronesia, and the East Indies. A paratype of *H. capitalis* and one of *H. eupolyphagus* were also examined and found to be identical with this species.

32. Hypothenemus eruditus Westwood.

Hypothenemus eruditus Westwood, 1836, Ent. Soc. London, Trans. **2**: 34. —Eichhoff, 1878 (1879), Soc. Roy. Sci. Liége, Mém. II, **8**: 165—Wood, 1954, Univ. Kansas Sci. Bull. **36**: 1058.

Hypothenemus insularis Perkins, 1900, Fauna Hawaiiensis 2 (3) : 181 (n. syn.).—Schedl, 1941, Hawaiian Ent. Soc., Proc. **11** (1) : 109 (part).—Swezey, 1941, Hawaiian Ent. Soc., Proc. **11** (1) : 117.

Cryphalus insularis, Hagedorn, 1910, Coleopt. Cat. **4**: 43.

Cryphalus eruditus, Hagedorn, 1910, Coleopt. Cat. **4**: 42.

Stephanoderes insularis, Schedl, 1942, B. P. Bishop Mus., Bull. **172**: 147.

Female: Length 1.10-1.25 mm., about 2.5 times as long as wide; color dark brown to almost black.

Frons convex above, a weak transverse impression above epistomal margin, usually with either a rather narrow, indistinct, median elevation of variable length between upper level of eyes and epistomal margin, or with a narrow, often indistinct, median groove, or with a combination of both; surface rugose-reticulate, with punctures varying from fine and obscure to rather coarse and deep; vestiture inconspicuous.

Pronotum about 1.1 times as long as wide; widest on basal third, sides feebly arcuate and indistinctly converging on basal half, rather broadly rounded in front; anterior margin armed by six serrations of about equal size; posterior areas reticulate, sparsely granulate and usually with a few, rather small, shallow punctures, rather coarsely granulate-punctate behind summit; vestiture hairlike, intermixed on posterior half with longer, equally abundant, scalelike setae.

Elytra 1.6 times as long as wide, 1.8 times as long as pronotum; striae indistinctly impressed, punctures moderately large, rather deep; interstriae slightly wider than striae, punctures small, close, confused. Declivity steep, convex; strial punctures smaller than on disc. Vestiture consisting of strial and interstrial hair; and uniseriate rows of erect, slightly longer scales, each scale on declivity about 3 to 4 times as long as wide.

Male: Similar to female except smaller, 0.7-0.8 mm., 2.2 times as long as wide; eye reduced in size; one or more serrations on anterior margin of pronotum may be absent; and pubescence usually longer and more slender.

DISTRIBUTION: Virtually cosmopolitan.

BONIN IS. CHICHI JIMA: Three, July 1951, R. Bohart.

VOLCANO IS. IWO JIMA: Seven, Sept. 1945, Dybas.

S. MARIANA IS. SAIPAN: 33, As Mahetog area, Jan. 1945, two, Dec. 1944, Feb.-Mar. 1945, 109, near Garapan, Dec. 1944, eight, hills east of Garapan, Jan. 1945, five, Halaihai-As Teo area, Jan.-Feb. 1945, three, Kalabera area, from *Pandanus* sp., Jan.-Feb. 1945, 11, Laulau Bay, Dec. 1944, Jan. 1945, two, Mt. Tagpochau, Jan. 1945, 11, Papago area, Jan. 1945, one, Magpi Mt. (Pidos Kalabe), Apr. 1945, five, Sadog Talofofo, Apr.-May 1945, all Dybas; three, Nov. 1944, Edgar; one, Aug. 1951, R. Bohart. TINIAN: One, Mar. 1945, and three, June 1946, Townes; three, ridge southeast section, Feb. 1945, five, north of Gurgan Point, Apr. 1945, three, Marpo Valley, Oct. 1945, 13, Mt. Lasso, Mar.-Apr. 1945, all Dybas. GUAM: Six, Pt. Ritidian, May 1945, two, 2 km. east of Yigo, May 1945, one, Pt. Oca, Mar. 1945, two, 2 km. southeast of Asan, Nov. 1947, one, Agana, May 1945, three, Pago Bay, June 1945, seven, Pati Pt., June 1945, all Dybas.

PALAU. BABELTHUAP: One, under bark of porch pole, one, dead banana leaves, one, beating, 17, Ulimang, *Ficus,* 35, all Dec. 1947, Dybas. KOROR: Five, limestone ridge north of inlet, beating, Jan. 1948, Dybas. NGERGOI: Two, beating, Aug. 1945, Dybas. PELELIU: One, July 1945, one, Aug. 1945, three, Jan. 1948, all Dybas.

YAP. YAP: Three, S. Ruul, July-Aug. 1950, Goss; one, Oct. 1952, Krauss.

CAROLINE ATOLLS. ULITHI: One, Falalop I., Oct. 1952, Krauss.

TRUK. PIS: One, June 1946, Townes.

PONAPE. One, Colonia-Net, Nov. 1937, Esaki; one, Exper. Sta., Sept. 1950, Adams; one, Nanipil, Net District, beating, Feb. 1948, Dybas.

KUSAIE. One, Malem River, 90 m., Apr. 1953, Clarke; one, 30 m., Mar. 1953, Clarke; one, Mutunlik, Jan. 1953, Gressitt.

MARSHALL IS. ENIWETOK: 13, Jobtan (Japtan) I., Nov. 1944, Dybas.

This species is distinguished from *H. areccae* by the smaller average size, and by the evenly convex frons; it is separated from *H. mangarevanus* by the

presence of rows of erect scalelike setae on the declivity and usually by more numerous interstrial hairs.

Specimens previously referred to under the name *Hypothenemus insularis* represent the same species encountered in Florida. All of the variations found in Micronesian and Hawaiian specimens were also observed in the North American material. Because complete intergradation between variations was found in individual long series from both areas, the only conclusion that can be drawn is that only one species is represented. The specimens of slightly smaller than average size, with the most common variation of frontal sculpture and of elytral vestiture, are identical in all respects with a single specimen from Westwood's type series in the U. S. National Museum.

The species described by Schedl under the name *H. insularis* (1934, Stylops 3 : 178) is another species.

33. **Hypothenemus mangarevanus** Beeson.

Hypothenemus mangarevanus Beeson, 1940, B. P. Bishop Mus., Occ. Papers **15** (18) : 196.

Female: Length 1.0-1.1 mm., 2.5 times as long as wide; color dark brown.

Frons evenly convex, slight impression above epistoma; surface reticulate, rather deeply punctured; vestiture inconspicuous.

Pronotum about equal in length and width; widest on basal third, sides weakly arcuate, rather broadly rounded in front; anterior margin armed by six serrations, lateral ones smaller; posterior areas subreticulate, finely, shallowly punctured laterally, becoming sparsely granulate behind summit; vestiture hairlike, intermixed on posterior half with longer, equally abundant, scalelike setae.

Elytra 1.6 times as long as wide, 1.7 times as long as pronotum; striae indistinctly impressed, punctures rather large, deep; interstriae as wide as striae, punctures fine, rather close, uniseriate, very finely granulate. Declivity steep, convex; striae and interstriae narrower than on disc, interstrial granules larger, closer. Vestiture consisting of rows of minute strial hair, and rows of erect interstrial bristles; interstrial bristles scalelike on disc, becoming narrower posteriorly, almost hairlike on declivity.

Male: Unknown.

DISTRIBUTION : Mangareva and S. Mariana Is.

S. MARIANA IS. SAIPAN : 11, As Mahetog area, beating, Jan.-Feb. 1945, one, hills east of Garapan, Jan. 1945, two, near Garapan, Dec. 1944, five, Halaihai-As Teo area, Jan. 1945, two, Mt. Tagpochau, 375 m., Feb. 1945, 12, Papago area, Jan. 1945, one, Sadog Talofofo, beating, Feb. 1945, all Dybas.

This species may be readily distinguished from other Micronesian representatives of the genus by the erect, rather broad, interstrial scales on the elytral disc which become slender and almost hairlike on the declivity.

Genus **Carposinus** Hopkins

Carposinus Hopkins, 1915, U. S. Dept. Agric., Rept. **99** : 47 (type : *C. pini*).—Schedl, 1952, Philippine Jour. Sci. **81** : 363.

Orosiotes Niisima, 1917, Essays Nawa, 1 (type : *O. kumatoensis*).

Pelicerus Eggers, 1923, Zool. Meded. Roy. Mus. Nat. Hist. Leyden **7**: 216 (type: *Lepicerus nitidus* Hagedorn).—Beeson, 1938, Federated Malay States Mus., Jour. **18**: 289.

This genus occurs from Malaya to Australia and eastward to Samoa. The species are phloeophagous, and very similar to the genus *Dryocoetes* in many respects. One species was found in Micronesia.

34. Carposinus brevior (Eggers).

Pelicerus brevior Eggers, 1927, Philippine Jour. Sci. **33**: 86.—Beeson, 1929, Insects of Samoa **4** (4): 231; 1938, Federated Malay States Mus., Jour. **18**: 289.

Carposinus brevior, Schedl, 1951, B. P. Bishop Mus., Occ. Papers **20** (10): 136; 1952, Philippine Jour. Sci. **81**: 363.

Female: Length 1.7-2.4 mm., 2.7 times as long as wide; color amber brown.

Frons rather weakly convex, transversely impressed just above epistoma; surface rather coarsely, closely granulate-punctate; vestiture long, rather abundant, yellow, somewhat shorter toward center. Eye broadly emarginate; coarsely granulate. Antennal funicle four-segmented.

Pronotum 1.2 times as long as wide; sides almost straight and subparallel on basal half, rather broadly rounded in front; anterior half finely, closely asperate, posterior half shining, rather coarsely, closely, deeply punctured, summit indefinite; glabrous, except for a few coarse, hairlike setae of moderate length on asperate area and near lateral margins to base; lateral margins acute on basal two-thirds.

Elytra shining, 1.6 times as long as wide, 1.5 times as long as pronotum; sides straight and subparallel on basal three-fourths, very broadly rounded behind; striae indistinctly impressed, one and two more strongly impressed near declivity, punctures rather large and deep, very close; interstriae slightly wider than striae, punctures about half as large as those of striae, close. Declivity very steep, convex; striae 1, 2, and 3 sinuate, apically curving toward suture, 1 more strongly impressed than on disc; interstriae 1, 2, and 3 wider than on disc, occupying most of declivital face, each bearing a uniseriate row of rather widely spaced, pointed granules; interspace 1 moderately elevated, 4 to 7 bearing granules, those on 7 rather large and, in combination with a prominence, forming an elevation extending to elytral apex. Vestiture inconspicuous, consisting of sparse, fine, moderately long, hairlike setae at sides and on declivity; disc glabrous.

Male: Similar to female except frons smooth, with fine punctures, vestiture sparse and rather inconspicuous.

DISTRIBUTION: Philippine, Samoan, S. Mariana, Caroline, and Gilbert Is.

S. MARIANA IS. SAIPAN: Six, Jan. 1945, Hagen; one, Apr. 1945, Ducoff; one, Aug. 1945, Dybas; 58, As Mahetog area, Nov. 1944, under bark, Jan. 1945, breadfruit tree, Feb., May 1945, at light, May, Sept. 1945, all Dybas.

YAP. YAP: Eight, July-Aug. 1950, Goss; five, Dugor, July-Aug. 1950, Goss; four, 1952, Krauss. GAGIL-TOMIL: One, Tomil District, July-Aug. 1950, Goss.

TRUK. WENA: Four, 30 m., June 1946, Townes; three, under bark of breadfruit, Feb. 1948, Dybas. TON (Tol): One, Apr. 1940, Yasumatsu and

Yoshimura. PIS: Three, Feb. 1949, Potts. TONOAS (Dublon): Two, rotten bark, Dec. 1935, Ono.

PONAPE. Twenty-three, Colonia, under dead breadfruit (*Artocarpus incisa*) bark, Feb. 1948, Dybas.

KUSAIE. Twenty-six, Mutunlik, 22 m., Jan., Mar. 1953, four, Pukusrik, Apr. 1953, four, Hill 541, 165 m., Feb.-Apr. 1953, all taken at light, Clarke.

MARSHALL IS. JALUIT: One, Majurirok, breadfruit, Apr. 1958, Gressitt.

HOST: Breadfruit (*Artocarpus* sp.).

Genus **Coccotrypes** Eichhoff

Coccotrypes Eichhoff, 1878 (1879), Soc. Roy. Sci. Liége, Mém. II, **8**: 57, 308. —Hagedorn, 1910, Coleopt. Cat. **4**: 68; 1910, Genera Insectorum **111**: 93. —Hopkins, 1914, U. S. Nat. Mus., Proc. **48**: 118 (type *Bostrichus dactyliperda* Fabricius).—Schedl, 1938, Ent. Bericht. Amsterdam **10**: 8.

This genus is essentially cosmopolitan in distribution since some species have been transported through commerce to all parts of the world. Usually, they breed in various seeds and nuts in tropical and subtropical areas. One species was recorded from Micronesia.

35. Coccotrypes carpophagus (Hornung).

Bostrichus carpophagus Hornung, 1842, Stett. Ent. Zeitung **3**: 116.

Coccotrypes integer Eichhoff, 1878 (1879), Soc. Roy. Sci. Liége, Mém. II, **8**: 311.—Beeson, 1922, Indian Forester, 494.

Coccotrypes nanus Eggers, 1920, Ent. Blätter **16**: 33.

Coccotrypes carpophagus, Eggers, 1929, Wiener Ent. Zeitung **46**: 52.—Schedl, 1942, B. P. Bishop Mus., Bull. **172**: 148; 1949, Tijdschr. Ent. **91**: 114.

Female: Length 1.6-1.9 mm., 2.1 times as long as wide; color reddish brown.

Frons convex, surface convergently aciculate; epistoma broadly emarginate; vestiture inconspicuous except on epistomal margin. Eye broadly emarginate; coarsely granulate. Antennal funicle five-segmented; club obliquely truncate.

Pronotum about equal in length and width; widest just behind middle, sides arcuate, rather strongly constricted on anterior third, anterior margin rather narrowly rounded; surface finely asperate, becoming more nearly granulate posteriorly, rather finely, sparsely granulate-punctate behind summit; vestiture fine, hairlike, rather long.

Elytra 1.2 times as long as wide, about 1.2 times as long as pronotum; sides almost straight and subparallel on basal half, rather broadly rounded behind; striae not impressed, punctures setiferous, rather large, distinct, shallow, spaced by distances about equal to their diameters; interstriae wider than striae, smooth and shining, each with a uniseriate row of very fine, setiferous, granulate punctures. Declivity convex, beginning just anterior to middle of elytra, moderately steep; strial punctures deeper, and interstriae somewhat narrower than on disc. Vestiture consisting of rows of rather long, fine, semirecumbent, strial hair; and rows of longer, erect, coarser, interstrial hair.

Male: Similar to female except smaller, about 1.3 mm.; frons more finely sculptured; eye reduced in size; and declivity more gradual.

DISTRIBUTION: Southern Asia to Australia, Hawaiian, S. Mariana, and Caroline Is.

S. MARIANA IS. SAIPAN: Eight, As Gonno, Oct. 1941, Matusita; 12, As Mahetog area, Nov., Dec. 1944, May, Oct. 1945, Dybas. GUAM: One, June 1945, Chaffee; 46, Pt. Oca, light trap, July 1945, G. Bohart and Gressitt; one, Mongmong, light trap, June 1945, G. Bohart and Gressitt;

YAP. YAP: Four, hill behind Kolonia (Yaptown), 60 m., light trap, Dec. 1952, Gressitt.

Genus **Poecilips** Schaufuss

Poecilips Schaufuss, 1897, Berliner Ent. Zeitschr. **42**: 110 (type: *P. sannio*). —Hagedorn, 1910, Coleopt. Cat. **4**: 77; 1910, Genera Insectorum **111**: 111. —Schedl, 1938, Ent. Bericht. Amsterdam **10**: 8.

Thamnurgides Hopkins, 1915, U. S. Dept. Agric., Rept. **99**: 45 (type: *T. persicae*).—Beeson, 1938, Federated Malay States Mus., Jour. **18**: 290.

Dendrurgus Eggers, 1923, Zool. Meded. Roy. Mus. Nat. Hist. Leyden **7**: 144.

The species of this genus occur principally in Africa, southern Asia, the East Indies, Australia, and the islands of the Pacific. Three species have been introduced into the New World. They breed either in the fruits or bark of their host plants.

Key to Micronesian Species of Poecilips

1. Pronotum devoid of asperities, rather sparsely punctured over entire surface.......... 2
   Pronotum asperate at least on anterior half.......... 4
2. Declivity flattened, lateral margin sharply elevated from interspace 7 to elytral apex; pronotum more coarsely punctured, punctures of uniform size......**36. striatus**
   Declivity convex, lateral margin rounded; pronotum more finely punctured, punctures variable in size.......... 3
3. Surface of pronotum subreticulate, with fine punctures; declivital bristles blunt, of uniform width..........**37. variabilis**
   Surface of pronotum smooth, with fine punctures; declivital bristles flattened and dilated distally..........**38. persicae**
4. Larger, more than 2.5 mm.; elytra acutely angulate behind; surface of pronotum reticulate, dull..........**39. fallax**
   Smaller, less than 1.7 mm.; elytra rather narrowly rounded behind; surface of pronotum smooth and shining..........**40. vulgaris**

36. **Poecilips striatus** (Eggers).

Thamnurgides striatus Eggers, 1927, Philippine Jour. Sci. **33**: 82.

Female: Length 1.6 mm., 2.5 times as long as wide; color dark brown.

Frons convex, convergently aciculate, rather deeply punctured above; vestiture inconspicuous. Eye emarginate; finely granulate. Antennal funicle five-segmented; club obliquely truncate.

Pronotum 1.07 times as long as wide, widest just behind center; sides moderately arcuate, convergent on anterior half, rather broadly rounded in front; entire dorsal surface smooth and shining, with rather large, widely separated, moderately deep punctures of

uniform size; vestiture consisting of sparse, inconspicuous long hair at sides and in front.

Elytra 1.6 times as long as wide; sides almost straight and subparallel on basal two-thirds, narrowly rounded behind; striae not impressed, punctures rather large, deep, very close; interstriae as wide as striae, punctures fine, not close, except rather coarse on interspaces 1 and 3 (perhaps an irregularity). Declivity rather steep, weakly convex, appearing flattened; lateral margin from interspace 7 to apex rather sharply elevated; striae somewhat impressed, interspaces appearing feebly convex, interstrial punctures subgranulate. Vestiture abraded, apparently hairlike on disc and bristlelike on declivity.

Male: Not available.

DISTRIBUTION: Philippine, Solomon, and Palau Is.

PALAU. BABELTHUAP: One, Ulimang, Dec. 1947, Dybas.

This species is readily distinguished from other Micronesian representatives of the genus by the sharp elevation extending from interspace 7 at the base of the declivity to the elytral apex.

Eggers' type and a series from the Solomon Islands (Guadalcanal) were also studied.

37. Poecilips variabilis (Beeson).

Thamnurgides variabilis Beeson, 1939, Indian Forest Rec. **5**: 286.

Poecilips niger Schedl, 1939, Federated Malay States Mus., Jour. **18**: 345. —Browne, 1949, Ann. Mag. Nat. Hist. XII, **1**: 897.

Female: Length 1.6-2.0 mm., 2.3 times as long as wide; color brown.

Frons weakly convex, surface reticulate and finely punctate; vestiture inconspicuous. Eye rather shallowly emarginate. Antennal funicle five-segmented; club obliquely truncate.

Pronotum 1.07 times as long as wide, widest behind center, sides moderately arcuate, converging on anterior half, rather broadly rounded in front; surface irregularly reticulate, moderately shining, rather finely and irregularly punctured, anterior margin with a few punctures almost imperceptibly subgranulate; vestiture consisting of inconspicuous, sparse, long hair.

Elytra 1.5 times as long as wide; sides straight and subparallel on basal two-thirds, rather narrowly rounded behind; striae not impressed, punctures rather large, distinct but not deep, close; interstriae as wide as striae, punctures fine, not close. Declivity convex, rather steep; lateral margin rounded; striae weakly impressed on upper half. Vestiture consisting of erect interstrial setae, hairlike on disc, rather stout, and usually with tips laterally compressed on declivity.

Male: The only recognizable male slightly smaller than females, but similar in all other respects.

DISTRIBUTION: Indo-Malayan area and Caroline Is.

YAP. GAGIL-TOMIL: One, Tomil District, Berlese funnel, July-Aug. 1950, Goss.

PONAPE. One, Nanwei, Aug. 1950, Adams; two, Mt. Temwetemwensekir, 150-300 m., under dead bark, Feb. 1948, Dybas; one, Nanipil, Net District, Feb. 1948, Dybas.

This species is readily distinguished from other Micronesian representatives of the genus by the complete absence of pronotal asperities, by the subreticulate surface of the pronotum, and by the rounded lateral margins of the declivity.

38. Poecilips persicae (Hopkins).

Thamnurgides persicae Hopkins, 1915, U. S. Dept. Agric., Rept. **99**: 45.—Schedl, 1941, Hawaiian Ent. Soc., Proc. **11** (1): 112.

Thamnurgides cubanus Eggers, 1934, Ent. Blätter **30**: 79 (n. syn.).

Female: Length 1.5-1.9 mm., 2.3 times as long as wide; color brown.

Frons weakly convex, surface shining, subaciculate below, punctured above; vestiture inconspicuous. Eye rather shallowly emarginate. Antennal funicle five-segmented; club obliquely truncate.

Pronotum 1.02 times as long as wide; widest behind center, sides moderately arcuate, converging on anterior half, rather broadly rounded in front; surface smooth and shining, rather finely and irregularly punctured, anterior margin with a few of the punctures almost imperceptibly subgranulate; vestiture consisting of inconspicuous, sparse, long hair.

Elytra 1.5 times as long as wide; sides straight and subparallel on basal two-thirds, rather narrowly rounded behind; striae not impressed, punctures rather large, distinct but not deep, close; interstriae wider than striae, punctures fine, not close. Declivity convex, rather steep; lateral margin rounded; striae weakly impressed on upper half. Vestiture consisting of erect interstrial setae, hairlike on disc, rather stout, and with tips dilated on declivity.

Male: Evidently smaller, but otherwise similar to female.

DISTRIBUTION: Cuba, Hawaiian, Palau, and Truk Is.

PALAU. KOROR: One, Aug. 1956, McDaniels.

TRUK. WENA: Mt. Chukumong (Teroken), inside nut of ivory nut palm, Dec. 1952, Gressitt.

This species is readily distinguished from other Micronesian representatives of the genus by the smooth, finely punctured dorsal surface of the pronotum, by the rounded lateral margins of the declivity, and by the distally flattened bristles of the elytral declivity.

The types of *Poecilips persicae* and *P. cubanus* were examined and found to be identical. A cotype of *P. sannio* Schaufuss was also examined and found to represent an allied, but distinct, species.

39. Poecilips fallax Eggers (fig. 8).

Poecilips fallax Eggers, 1927, Treubia **9**: 399.

Female: Length 2.5-2.9 mm., 2.6 times as long as wide; color very dark brown.

Frons convex, surface dull, rugose-reticulate, and obscurely punctured; vestiture inconspicuous. Eye shallowly emarginate. Antennal funicle five-segmented; club obliquely truncate.

Pronotum 1.01 times as long as wide; widest behind center, sides moderately arcuate, rather broadly rounded in front; surface finely, rather closely asperate on anterior half, becoming more sparsely and finely granulate behind to base; surface dull, rather coarsely reticulate between asperities and granules; vestiture consisting of inconspicuous, sparse, long hair.

Elytra 1.7 times as long as wide; sides straight and subparallel on more than basal half, posterior half tapered to a subacute angle behind; striae weakly impressed behind, punctures rather small and deep; interstriae as wide as striae, punctures rather fine, not close. Declivity moderately steep, weakly convex; striae more strongly impressed, particularly 1; sutural interspace slightly elevated. Vestiture consisting of rows of erect, moderately long, hairlike, interstrial setae.

Male: Not recognizable in material at hand.

DISTRIBUTION: Malaya, Java, and Marshall Is.

MARSHALL IS. AILINGLAPALAP: Bikajela I., mangrove, Nov. 1948, Langford.

This species is readily distinguished from other Micronesian representatives of the genus by the much larger size, by the asperate pronotum, and by the narrowly angulate posterior outline of the elytra.

This series of 27 specimens was compared with Eggers' type and with specimens from Malaya and found to agree in all respects.

40. Poecilips vulgaris (Eggers).

Dendrurgus vulgaris Eggers, 1923, Zool. Meded. Roy. Mus. Nat. Hist. Leyden **7**: 151.

Thamnurgides vulgaris, Eggers, 1925, Ent. Odd. Nar. Mus. Praze, Sbornik **3**: 153.—Beeson, 1929, Insects of Samoa **4** (4): 228.

Poecilips vulgaris, Schedl, 1942, Tijdschr. Ent. **85**: 3; 1951, B. P. Bishop Mus., Occ. Papers **20** (10): 135.

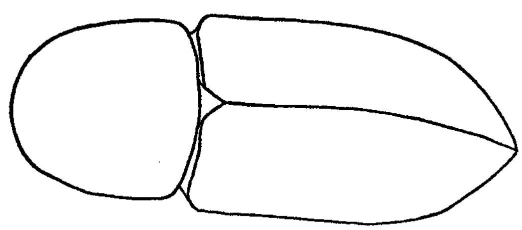


FIGURE 8.—*Poecilips fallax,* dorsal view.

Female: Length 1.5-1.7 mm., 2.6 times as long as wide; color brown.

Frons convex, shining, partly aciculate below, punctate above; vestiture inconspicuous. Eye shallowly emarginate; finely granulate. Antennal funicle five-segmented; club obliquely truncate.

Pronotum 1.1 times as long as wide; widest behind center, sides moderately arcuate, rather broadly rounded in front; surface finely, closely asperate on anterior area, asperities covering anterior third of pronotum in median area, and extending to basal third at sides; non-asperate area finely, rather deeply punctured, spaces between punctures smooth and shining; vestiture consisting of sparse, inconspicuous, long hair at sides and in front.

Elytra 1.6 times as long as wide; sides straight and subparallel on basal two-thirds, rather broadly rounded behind; striae not impressed, punctures rather small, not deep, close; interstriae as wide as striae, punctures of moderate size, not close. Declivity rather steep, weakly convex; lateral margin rounded; striae weakly impressed on upper half; interstrial punctures very feebly granulate. Vestiture consisting of rows of rather fine strial hair; and rows of relatively short, erect, interstrial setae, hairlike on disc, bristlelike on declivity.

Male: Not recognizable in material at hand.

DISTRIBUTION: Indo-Malayan area of New Guinea, Philippine, Samoan, and Caroline Is.

PALAU. Peleliu: One, Aug. 1945, Dybas.

PONAPE. Twenty-three, Mt. Temwetemwensekir, 450 m., Mar. 1945, Dybas.

This species is readily distinguished from other Micronesian representatives of the genus by the asperate pronotum, by the rather broadly rounded posterior outline of the elytra, and by the presence of rows of fine strial hair on at least the declivital area.

Genus **Xyleborus** Eichhoff

Xyleborus Eichhoff, 1864, Berliner Ent. Zeitschr. **8**: 37; 1878 (1879), Soc. Roy. Sci. Liége, Mém. II, **8**: 315.—Hagedorn, 1910, Genera Insectorum **111**: 150; 1910, Coleopt. Cat. **4**: 97.—Hopkins, 1914, U. S. Nat. Mus., Proc. **48**: 131 (type; *Bostrichus monographus* Fabricius).

This cosmopolitan genus, the largest in the family, is represented in the literature by more than 1,000 specific names. The species bore in the woody tissues of various plants where they feed upon the ambrosial fungus that grows on the walls of the galleries. Because of their secretive woodboring habits, they are easily transported through commerce. The facility with which they spread from one geographical area to another is illustrated by the cosmopolitan, or near cosmopolitan, distributions of the majority of the Micronesian species.

Key to Micronesian Species of Xyleborus

1. Anterior coxae widely separated; pronotum wider than long, anterior margin serrate; sutural profile of elytra arching from base; small, stout species less than 2.0 mm. long.......... **41. morigerus**

   Anterior coxae contiguous (or very narrowly separated); pronotum usually longer than wide; larger species exceeding 2.4 mm. in length, or if small, body form slender.......... 2

2. Anteromedian margin of pronotum produced and armed by about six coarse serrations; interspace 2 near center of declivity with one large conical tubercle (fig. 9, *b, c*), each of the other declivital interspaces with a row of very fine, rather widely spaced granules; elytra subacuminate behind; length 3.4-3.5 mm. .... **42. bidentatus**

   Anteromedian margin of pronotum not produced, and usually unarmed; declivital interspace 2 entirely unarmed, or at most with fine granules.......... 3

3. Elytra truncate behind (fig. 10, *a, b*), declivital face subvertical and circular, with margin elevated; length 2.8-2.9 mm. .... **43. versicolor**

   Upper margin of declivity rounded, declivital face more oblique.......... 4

4. Body rather stout; pronotum as wide as long, with anterior margin armed by about six or eight serrations.......... 5

   Body more slender; pronotum usually conspicuously longer than wide, anterior margin unarmed.......... 6

5. Declivital surface smooth and shining, with strial punctures distinctly impressed, and each interspace with a row of fine granules; mature color almost black; length 2.0-2.6 mm. .... **44. fornicatus**

Declivital surface dull, strial punctures obsolete, and surface closely covered by fine, confused granules; mature color reddish brown; length 2.2-2.4 mm. .... **45. semigranosus**

6. Length at least 2.9 mm., pronotum as wide as long; elytral declivity flattened, weakly impressed on apical half, interspaces each with a row of fine granules........ 7

Length less than 2.7 mm. (except *buxtoni*, 2.8-3.0 mm.); pronotum distinctly longer than wide; declivity convex or flattened, interspace 2 devoid of granules on declivital face except in *indicus, laevis, kororensis*, and *agnatus*............ 8

7. Length 2.9-3.1 mm.; punctures on posterior area of pronotum obscure, very sparse; strial punctures on declivity shallow and as small as on disc; declivital striae 3 feebly curved toward suture at apex (fig. 11, *a*)....**46. senachalensis**

Length 4.5-5.0 mm.; punctures on posterior area of pronotum rather fine, close, and deep; strial punctures deeper and larger, larger on declivity than on disc; declivital striae 3 strongly curved toward suture at apex (fig. 11, *b*) .... **47. destruens**

8. Scutellum conical, pointed; posterolateral margin of declivity with about three teeth at apex of interspaces 2 to 4 (fig. 11, *c*); declivital interspace 2 very narrow; length 1.6-1.7 mm. .... **48. exiguus**

Scutellum flat, triangular; posterolateral margin of declivity carinate or rounded, but not dentate.. 9

9. Strial punctures on disc small, only slightly larger than the closely spaced interstrial punctures; declivital interspace 2 with a row of fine granules, those at upper margin (usually one or two) and at apex (usually one) distinctly larger (fig. 11, *d*); posterolateral margin of declivity rounded; elytral vestiture abundant; length 2.5-2.7 mm. .... **49. agnatus**

Punctures of striae usually distinctly larger on disc than those of interspaces; declivital interspace 2 devoid of granules, or posterolateral margin of declivity sharply elevated; pubescence rather sparse.. 10

10. All declivital interspaces equally granulate; posterolateral margin of declivity carinate 11

Declivital interspace 2 devoid of granules, 1 and 3 each with one or more tubercles; posterolateral margin of declivity rounded or acutely elevated.......... 13

11. Declivital striae feebly or not at all impressed, interspace 2 flat, others at most weakly raised; interstrial granules on declivity widely spaced (fig. 12, *a, b*); discal interspaces impunctate; length 2.3 mm. .... **50. indicus**

Smaller, 1.6-1.7 mm.; discal interspaces regularly, rather finely punctured; declivital striae either weakly or strongly impressed.. 12

12. Declivital striae weakly impressed, punctures distinct, interstriae very feebly convex and with fine granules (fig. 12, *c*).. **51. laevis**

Declivital striae rather strongly impressed, punctures at least partly confluent, the interstriae more strongly raised and with coarser granules (fig. 12, *d*) .... **52. kororensis**

13. Discal interspaces usually almost impunctate; declivital interspace 3 with one tubercle near center of declivity conspicuously larger than the others (fig. 13, *a*); length 2.3-2.7 mm. .... **53. ferrugineus**

Discal interspaces regularly punctured; a tubercle on declivital interspace 3 not conspicuously larger than those of some other interspaces.. 14

14. Declivital interspace 1 conspicuously wider than 2 or 3 and armed by two or three widely spaced tubercles, second of these conspicuously larger than other declivital tubercles; declivital striae 1 diverging from suture and passing lateral to largest tubercle (fig. 13, *b*); length 2.3-2.5 mm. .... **54. similis**

Declivital interspace 1 not wider than 3, none of tubercles conspicuously larger than those on interspace 3.. 15

15. Larger, 2.9-3.1 mm.; at least some of interstrial punctures on elytral disc finely tuberculate..**55. buxtoni**
    Smaller, less than 2.7 mm. long; interstrial punctures on disc almost never tuberculate 16
16. Discal striae, particularly 1, at least weakly impressed; elytral declivity steeper and more strongly convex (fig. 13, *d*); color normally darker; average size slightly larger, 2.4-2.6 mm. ....**56. volvulus**
    Discal striae not impressed; elytral declivity more gradual and less strongly convex; color reddish brown; average size about 2.2-2.4 mm. 17
17. Surface of elytral declivity smooth and shining; declivital tubercles of larger average size; declivity steeper, more convex (fig. 13, *e*)........................**57. perforans**
    Surface of elytral declivity dull, opalescent; declivital tubercles of smaller average size; declivity more gradual, less strongly convex (fig. 13, *f*)........**58. affinis**

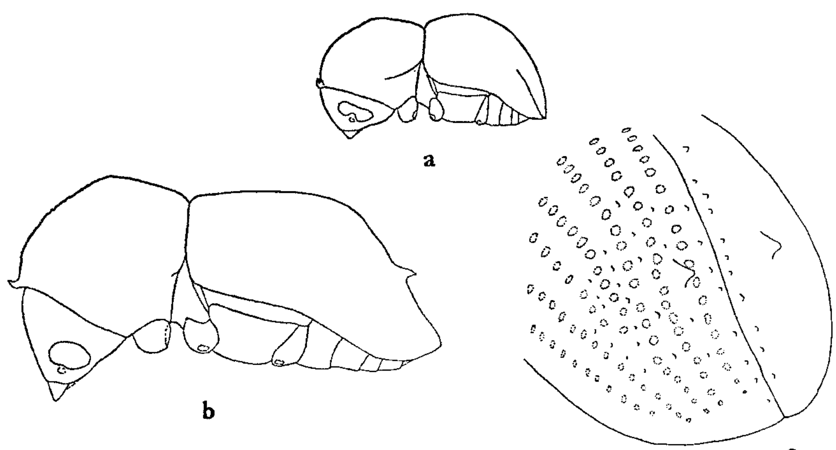


FIGURE 9.—**a**, *Xyleborus morigerus*, lateral view, female. **b**, **c**, *X. bidentatus*, female: *b*, lateral view; *c*, posterolateral view, declivity.

41. **Xyleborus morigerus** Blandford (fig. 9, *a*).

Xyleborus morigerus Blandford, 1894, Insect Life **6**: 264.—Beeson, 1929, Insects of Samoa **4** (4): 233; 1930, Indian Forest Rec. **14**: 249.—Schedl, 1950, B. P. Bishop Mus., Occ. Papers **20** (3): 39.

Female: Length 1.6-1.9 mm., 1.9 times as long as wide; color very dark brown.

Frons convex, surface reticulate with rather coarse, obscure punctures; vestiture inconspicuous. Eye deeply emarginate; rather finely granulate.

Pronotum 1.1 times as wide as long; widest just behind center, sides arcuate, rather narrowly rounded in front; anterior margin armed by six low serrations; summit behind center; anterior area asperate; posterior area shining, almost imperceptibly reticulate, minute punctures scarcely evident; vestiture very sparse, short.

Elytra 1.07 times as long as wide, 1.2 times as long as pronotum; sides straight and subparallel on more than basal half, very broadly rounded behind; scutellum rather large, flat; striae not impressed, punctures small, distinct, rather shallow; interstriae smooth and shining, about three times as wide as striae, punctures fine, spacing about equal to

that of strial punctures. Declivity rather abrupt, steep, convex, lateral margin sharply carinate from interspace 7 to elytral apex; interstrial punctures feebly granulate, otherwise similar to those on disc. Vestiture consisting of rows of minute strial hair, and rows of longer, erect, interstrial hair; longer and more conspicuous on declivity, often abraded on disc.

Anterior coxae widely separated. Mesosternum gibbous.

Male: Not represented in material at hand.

DISTRIBUTION: Reported from numerous areas, but evidently its normal breeding range is from Ceylon to New Guinea, Philippine, Samoan, and Caroline Is.

S. MARIANA IS. SAIPAN: One, Mt. Tagpochau, 375 m., Feb. 1945, Dybas. GUAM: Three, Mt. Lamlam, Feb. 1958, Krauss.

TRUK. TON: One, Mt. Unibot, 390 m., Jan. 1953, Gressitt.

PONAPE. One, Mt. Dolen Nankep, 530-570 m., Aug. 1946, Townes; two, Mt. Kupwuriso, 300 m., Mar. 1948, Dybas; five, Mt. Nahnalaud, 600 m., *Pandanus* leaf, Mar. 1948, Dybas; two, Nanipil, Net District, Feb. 1948, Dybas.

This species is readily distinguished from other Micronesian representatives of the genus by the widely separated anterior coxae and by the very stout body form.

The identification of the above material was based on a comparison of these specimens with the paratype of *Xyleborus morigerus* Blandford which is in the Canadian National Collection.

42. Xyleborus bidentatus (Motschulsky). (Figure 9, *b, c.*)

Phloeotrogus bidentatus Motschulsky, 1863, Soc. Imp. Nat. Moscou, Bull. **36** (2): 514.

Xyleborus bidentatus, Eichhoff, 1878 (1879), Soc. Roy. Sci. Liége, Mém. II, **8**: 505.—Beeson, 1930, Indian Forest Rec. **14**: 288.—Schedl, 1952, Ent. Blätter **47-48**: 162.

Boroxylon stephegynis Hopkins, 1915, U. S. Dept. Agric., Rept. **99**: 58.

Female: Length 3.4-3.5 mm., 2.5 times as long as wide; color very dark brown, almost black.

Frons convex, with a transverse impression above epistoma, median line elevated on impressed area; surface reticulate and finely punctured; vestiture inconspicuous. Eye very shallowly emarginate; rather finely granulate.

Pronotum 1.1 times as long as wide; appearing subquadrate, sides weakly arcuate and anterior margin slightly produced medially and armed by about six coarse serrations; summit at middle, subtransverse; anterior area rather coarsely asperate; coarsely reticulate and with a few scattered granules behind; vestiture sparse, inconspicuous.

Elytra 1.5 times as long as wide, 1.4 times as long as pronotum; sides straight and subparallel on basal two-thirds, obtusely angulate behind; striae not impressed, punctures rather coarse; interstriae slightly wider than striae, their contour somewhat irregular, punctures indefinite, appearing irregular in size, sparse. Declivity rather steep, convex above, moderately produced toward apex; surface granulose-reticulate, dull; strial punctures very shallow; interstrial punctures finely tuberculate, with one tubercle near center of declivity on interspace 2 greatly enlarged and sharply pointed. Vestiture consisting of rows of erect interstrial hair, somewhat longer and more abundant on declivity.

Male: Not represented in material at hand.

DISTRIBUTION: Africa, Indo-Malayan area, Philippine and Caroline Is.

PALAU. PELELIU: One, east coast, Aug. 1945, Baker.

KUSAIE. One, Mutunlik, 22 m., Feb. 1953, Clarke; about 300, Pukusrik, 1 m., mangrove, light trap, Apr. 1953, Clarke.

This species is readily distinguished from other Micronesian representatives of the genus by the large size, by the slightly produced and armed anterior margin of the pronotum, by the rather narrowly angulate posterior outline of the elytra, and by the presence of a pair of rather large, pointed tubercles on interspace 2 near the middle of the declivity.

This species was found in Eggers' collection at the U. S. National Museum under the names *Xyleborus bidentatus* Motschulsky, *X. brevidentatus* Eggers, and *X. riehli* Eichhoff. Since these species were not represented by type material, notes concerning their suspected synonymy must be delayed.

43. Xyleborus versicolor Sampson (fig. 10, *a, b*).

Xyleborus versicolor Sampson, 1921, Ann. Mag. Nat. Hist. IX, **7**: 29.—Browne, 1949, Ann. Mag. Nat. Hist. XII, **1**: 904.

Female: Length 2.7-2.8 mm., 2.3 times as long as wide; color yellowish brown.

Frons convex, ground surface reticulate below, becoming minutely beaded above, area below upper level of eyes with sparse, rather coarse shining granules; vestiture inconspicuous. Eye half divided by a deep emargination.

Pronotum 1.1 times as long as wide; sides almost straight and subparallel on basal half, rather narrowly rounded in front; anterior margin armed by about six low serrations; summit at middle; anterior area rather finely asperate, finely punctured behind, ground surface between punctures and asperities finely reticulate; vestiture short, inconspicuous, visible only on asperate area.

Elytra 1.2 times as long as wide, 1.2 times as long as pronotum; sides straight and subparallel to declivital margin, sharply truncate behind; striae not impressed, punctures small, not deep, rather widely spaced; interstriae about three times as wide as striae, smooth, shining, punctures about two-thirds as large as those of striae and more closely spaced. Declivity abruptly truncate, subvertical, margin rather sharply elevated on complete circle; face flat, except slightly elevated toward sutural apex; striae 1, 2, and 3 indicated by large, shallow punctures, each interspace with row of rounded granules, those on interspace 1 rather close. Elytra glabrous, except for sparse, minute hair on raised declivital margins and on declivital interspaces.

Anterior coxae subcontiguous. Mesosternum obliquely rounded.

Male: Not represented in material at hand.

DISTRIBUTION: Malaya and Ponape Is.

PONAPE. One, Mt. Beirut, 660 m., beating, July 1950, Adams; one, Nanipil, Net District, Feb. 1948, Dybas.

This species is readily distinguished from other Micronesian representatives of the genus by the sharply truncate elytral declivity which has the margin carinate on a complete circle around the flattened, subvertical face.

The Micronesian specimens agree in all respects with the Malayan material examined by Schedl and Browne.

44. Xyleborus fornicatus Eichhoff (fig. 10, *c*).

Xyleborus fornicatus Eichhoff, 1868, Berliner Ent. Zeitschr. **12**: 151.—Hagedorn, 1910, Coleopt. Cat. **4**: 104.—Beeson, 1930, Indian Forest Rec. **14**: 234.

Female: Length 2.0-2.6 times as long as wide; color very dark brown, almost black. Frons convex, with a slight transverse impression just above epistoma; surface reticulate and sparsely punctured; vestiture inconspicuous. Eye about half divided by an emargination; finely granulate.

Pronotum equal in length and width; sides moderately arcuate, rather broadly rounded in front; anterior margin armed by eight low serrations; summit at center; anterior area

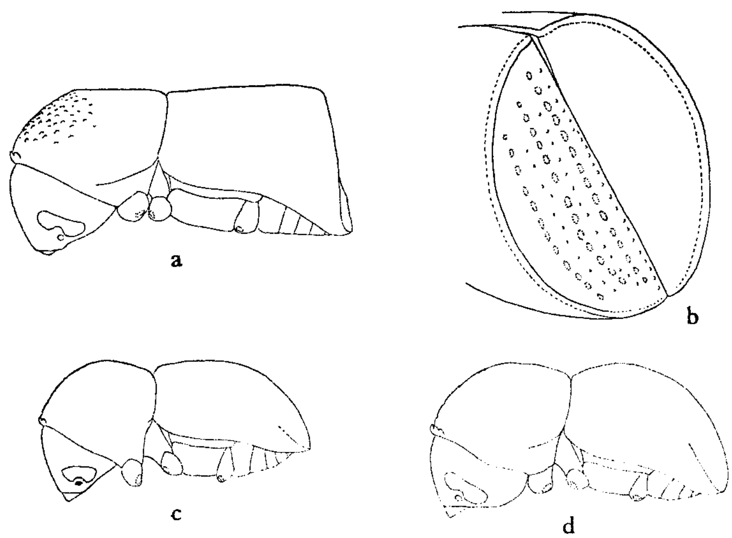


FIGURE 10.—**a**, **b**, *Xyleborus versicolor,* female: *a,* lateral view; *b,* posterolateral view, declivity. **c**, *X. fornicatus,* lateral view, female. **d**, *X. semigranosus,* lateral view, female.

finely asperate, finely reticulate and minutely punctured behind; vestiture sparse, inconspicuous.

Elytra 1.3 times as long as wide, 1.4 times as long as pronotum; sides almost imperceptibly arcuate on basal two-thirds, rather broadly rounded behind; striae not impressed, punctures rather small; interstriae smooth and shining, about three times as wide as striae, punctures rather fine, minutely granulate, not close. Declivity moderately steep, weakly convex; lateral margin carinate from interspace 7 to elytral apex; interstrial granules larger than on disc and usually pointed. Vestiture consisting of rows of erect, interstrial, hairlike setae, those on declivity somewhat larger.

Male: Not represented in material at hand.

DISTRIBUTION: India to Australia, Hawaiian Is., and Micronesia.

BONIN IS. CHICHI JIMA: Four, Omura, under bark, July 1949, Mead.

PALAU. KOROR: Two, Nov. 1947, Dybas. PELELIU: Two, north ridge, Jan. 1948, Dybas.

YAP. MAP: One, Oct. 1952, Krauss.

PONAPE. One, Awakpah, Uh District, breadfruit, Mar. 1948, Dybas; one, Mt. Kupwuriso, 300-450 m., beating vegetation, Mar. 1948, Dybas; two, Nanipil, Net District, Feb. 1948, Dybas.

This species is distinguished from other Micronesian representatives of the genus by the rather stout body form, by the armed anterior margin of the pronotum, and by the smooth, shining surface of the declivity which has distinctly impressed strial punctures.

This species is an important pest of tea.

45. Xyleborus semigranosus Blandford (fig. 10, *d*).

Xyleborus semigranosus Blandford, 1896, Ent. Soc. London, Trans. **1896**: 211.—Beeson, 1915, Indian Forester, 297; 1929, Insects of Samoa **4** (4): 236; 1930, Indian Forest Rec. **14**: 255.

Xyleborus mascarenus Hagedorn, 1908, Deutsche Ent. Zeitschr. **3**: 379.

Dryocoetes bengalensis Stebbing, 1908, Indian Forest Mem., Forest Zool. **1** (1): 12.

Female: Length 2.3-2.4 mm., 2.1 times as long as wide; color reddish brown.

Frons convex, rather coarsely reticulate and sparsely, finely granulate; vestiture inconspicuous. Eye about half divided by an emargination; rather finely granulate.

Pronotum 1.02 times as wide as long; widest behind middle, sides moderately arcuate, rather narrowly rounded in front; anterior margin armed by about eight low serrations; summit at middle; anterior area rather finely asperate, almost imperceptibly reticulate and finely, rather deeply punctured behind; vestiture inconspicuous.

Elytra 1.2 times as long as wide, 1.2 times as long as pronotum; sides straight and subparallel on basal two-thirds, rather broadly rounded behind; striae not impressed, punctures very small and shallow; interstriae about four times as wide as striae, punctures small, irregular, rather numerous. Declivity steep, convex, lateral margin carinate from interspace 7 to elytral apex; strial and interstrial punctures obsolete, entire surface dull and finely, closely granulate. Vestiture consisting of fine erect hair in semidefinite rows, those arising from strial punctures much shorter than those arising from interstrial punctures, longer on declivity.

Male: Not represented in material at hand.

DISTRIBUTION: Africa, southern Asia, New Guinea, Philippine, Samoan, Hawaiian, and Caroline Is.

PALAU. BABELTHUAP: Two, East Ngatpang, 65 m., light trap, Dec. 1952, Gressitt. KOROR: Four, limestone ridge south of inlet, beating vegetation, Jan. 1948, Dybas; one, Nov. 1951, Gressitt; one, Jan. 1954, Beardsley. NGARMALK: One, limestone ridge, 25 m., Dec. 1952, Gressitt.

This species is readily distinguished from other Micronesian representatives of the genus by the rather large, stout body form, by the serrate anterior margin of the pronotum, and by the dull, finely granulate, declivital surface which lacks strial punctures.

46. Xyleborus senachalensis Beeson (fig. 11, *a*).

Xyleborus senachalensis Beeson, 1930, Indian Forest Rec. **14**: 212.

Female: Length 2.9-3.1 mm., 2.6 times as long as wide; color very dark brown.

Frons weakly convex, surface reticulate and sparsely punctured; vestiture inconspicuous. Eye less than half divided by an emargination, rather finely granulate.

Pronotum equal in length and width, appearing subquadrate; sides and anterior margin rather weakly arcuate; anterior margin unarmed; summit at center; anterior area rather finely asperate, asperities extending to basal one-third at sides; posterior area reticulate, sparse punctures minute; vestiture inconspicuous.

Elytra 1.5 times as long as wide, 1.6 times as long as pronotum; sides straight and subparallel on basal two-thirds, rather broadly rounded behind; striae not impressed, punctures rather small, shallow, close; interstriae about twice as wide as striae, punctures fine, minutely granulate, about half as numerous as those of striae. Declivity (fig. 11, *a*) rather steep, convex but somewhat flattened on lower half; lateral margin from interspace 7 to elytral apex rather strongly elevated, but not sharply carinate; sutural interspace feebly elevated toward apex, not noticeably constricted apically by curvature of sutural striae; interstrial granules somewhat larger than on disc. Vestiture consisting of rows of minute strial hair, and rows of erect, rather long, interstrial hair, somewhat longer and coarser on declivity.

Male: Not represented in material at hand.

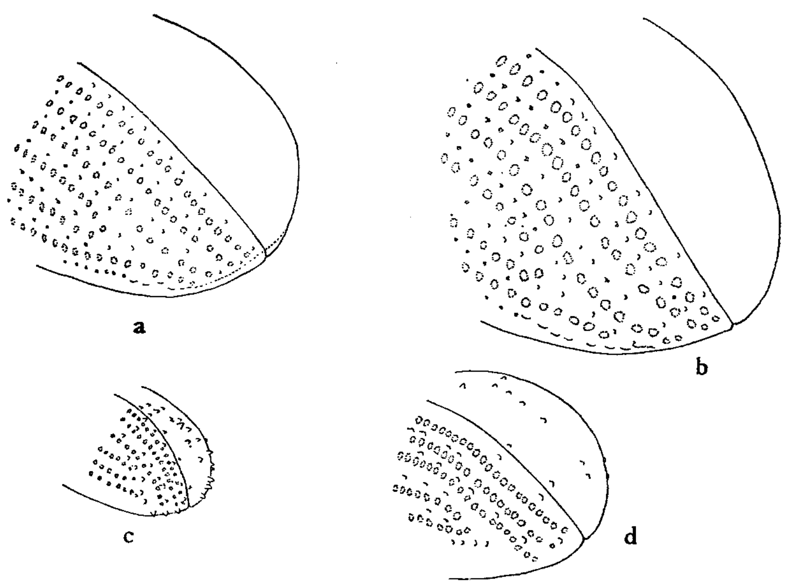


FIGURE 11.—*Xyleborus* spp., posterolateral view, female declivity: **a**, *senachalensis;* **b**, *destruens;* **c**, *exiguus;* **d**, *agnatus.*

DISTRIBUTION: India and Caroline Is.

PONAPE. Seven, Mt. Kupwuriso, 570 m., June-Sept. 1950, Adams; one,

Mt. Nahnalaud, 300 m., Mar. 1948, Dybas; one, Mt. Dolen Nankep, 530-600 m., Aug. 1946, Townes.

This species is distinguished from other Micronesian representatives of the genus by the unarmed anterior margin of the pronotum, by the pronotum being equal in length and width, by the flattened declivity with all interspaces finely tuberculate, by the curvature of the sutural striae on the declivity, and by the punctation of the pronotum.

The identity of this species is uncertain. It was determined by comparing these specimens with two other species that were included in Beeson's key (1930, Indian Forest Rec. **14**: 234) to the Indian species of this group. The Micronesian specimens appear to be almost identical to *Xyleborus andamanensis* Blandford, except that the declivital vestiture is much longer and more slender.

47. Xyleborus destruens Blandford (fig. 11, *b*).

Xyleborus destruens Blandford, 1896, Ent. Soc. London, Trans. **1896**: 221. —Roepke, 1919, Treubia **1**: 15.—Beeson, 1929, Insects of Samoa **4** (4): 240.

Female: Length 4.5-5.0 mm., 2.7 times as long as wide; color very dark brown.

Frons weakly convex, surface reticulate and sparsely punctured; vestiture inconspicuous. Eye half divided by an emargination; rather finely granulate.

Pronotum equal in length and width, appearing subquadrate; sides and anterior margin rather weakly arcuate; anterior margin unarmed; summit at center; anterior area rather finely asperate, asperities extending to basal third at sides; posterior area reticulate, sparse punctures minute; vestiture inconspicuous.

Elytra 1.7 times as long as wide, 1.6 times as long as pronotum; sides straight and subparallel on basal two-thirds, rather broadly rounded behind; striae feebly impressed, punctures rather small, shallow, close; interstriae about twice as wide as striae, punctures fine, about half as numerous as those of striae, and about half of them finely granulate, appearing irregular. Declivity (fig. 11, *b*) rather steep, flattened on lower half; lateral margin from interspace 7 to apex rather strongly elevated and irregularly carinate; strial punctures about twice as large as on disc; apically striae 1 to 3 curve strongly toward suture; interspace 1 much narrower toward apex. Vestiture consisting of rows of minute strial hair, each hair shorter than diameter of punctures; and rows of rather long, erect, interstrial hair; appearing somewhat shorter on declivity.

Male: Not represented in material at hand.

DISTRIBUTION: Andaman, Sumatra, Java, Papua, Samoan, and Caroline Is.

PALAU. KOROR: Limestone ridge south of inlet, beating vegetation, Jan. 1948, Dybas.

This species is more closely allied to *Xyleborus senachalensis* than to other Micronesian representatives of the genus, but is readily distinguished by the larger size, by the distinctly more closely punctured pronotum, and by the curvature of the sutural striae which conspicuously reduces the apical width of the sutural interspace.

48. Xyleborus exiguus Walker (fig. 11, *c*).

Bostrichus exiguus Walker, 1857, Ann. Mag. Nat. Hist. III, **3**: 260.

Xyleborus muriceus Eichhoff, 1878 (1879), Soc. Roy. Sci. Liége, Mém. II, **8**: 506.

Xyleborus exiguus, Blandford, 1896, Ent. Soc. London, Trans. **1896**: 228. —Eggers, 1925, Ent. Odd. Nar. Mus. Praze, Sbornik **3**: 154.—Beeson, 1930, Indian Forest Rec. **14**: 233.—Schedl, 1950, B. P. Bishop Mus., Occ. Papers **20** (3): 40.

Female: Length 1.6-1.7 mm., 2.8 times as long as wide; color very dark brown.

Frons convex, surface reticulate and rather sparsely, deeply punctured; vestiture inconspicuous except along epistomal margin. Eye half divided by an emargination, finely granulate.

Pronotum 1.2 times as long as wide, widest just in front of middle, sides almost straight on basal half, anterior margin broadly rounded and unarmed; summit two-fifths from anterior margin; declivous area finely asperate; posterior area reticulate and very finely punctured; vestiture consisting of fine, rather short, sparse, erect hair.

Elytra 1.6 times as long as wide, 1.3 times as long as pronotum; sides straight, converging somewhat toward rather narrow declivity, serrate posterior outline rather broadly rounded; scutellum conical, pointed; striae not impressed, punctures small, shallow; interstriae about twice as wide as striae, punctures about two-thirds as large as those of striae and somewhat less abundant, becoming rather coarsely granulate toward declivity, those on interspace 1 reaching basal third. Declivity (fig. 11, *c*) moderately steep, rather narrow, flattened; lateral margin obtusely elevated and armed by a series of coarse teeth, usually three in number, located at apices of interspaces 3 and 4; interspace 2 very narrow, unarmed; 1 rather finely tuberculate almost to apex, 3, 5, and 7 with a few rather coarse tubercles on upper half. Vestiture consisting of rows of minute strial hair; and rows of erect, rather long, interstrial hair; somewhat longer and coarser on declivity.

Male: Not represented in material at hand.

DISTRIBUTION: Southern Asia to New Guinea, Philippine, Fijian, and Caroline Is.

PALAU. KOROR: One, Oct. 1952, Beardsley; one, Feb. 1954, Beardsley. NGARMALK: One, Sept. 1952, Krauss; May 1953, Beardsley.

TRUK. TON: One, Olej-Foup, June 1940, Yasumatsu and Yoshimura. WENA: One, July 1939, Esaki.

PONAPE. One, Mt. Kupwuriso, Mar. 1948, Dybas.

KUSAIE. One, Malem River, Dec. 1937, Esaki; two, Malem River, 90 m., Apr. 1953, Clarke.

This species is readily distinguished from other Micronesian representatives of the genus by the conical scutellum, by the presence of about three teeth on the posterolateral margin of the declivity at apices of interspaces 2 to 4, and by the small size and slender body form.

The Micronesian specimens agree favorably with material examined by Browne, Eggers, and Schedl from the Indo-Malayan region and the East Indies. An exception to this was a series taken at Fadang, Guam, May 31, 1945, by Dybas, which is much larger and more coarsely sculptured. Because they

were thought to represent a different unrecognized species, an example was sent to Schedl for identification. Although aberrant, Schedl included the specimen in *Xyleborus exiguus*.

49. Xyleborus agnatus Eggers (fig. 11, *d*).

Xyleborus agnatus Eggers, 1923, Zool. Meded. Roy. Mus. Nat. Hist. Leyden **7**: 197.—Browne, 1938, Malayan Forester **7**: 27.

Female: Length 2.5-2.7 mm., 2.9 times as long as wide; color reddish brown.

Frons convex, surface reticulate and finely, sparsely granulate, with a short median groove at vertex; vestiture inconspicuous except along epistomal margin. Eye half divided by an emargination; rather finely granulate.

Pronotum 1.3 times as long as wide, widest just in front of middle, sides almost straight on basal half, anterior margin broadly rounded and unarmed; summit just in front of middle; anterior area finely asperate; reticulate and finely, rather closely punctured behind; vestiture consisting of fine, rather short, erect hair.

Elytra 1.7 times as long as wide, 1.3 times as long as pronotum; sides straight and subparallel on basal two-thirds, rather broadly rounded behind; striae not impressed, punctures small; interstriae about three times as wide as striae, punctures about equal in size to those of striae, but spacing and position more irregular. Declivity (fig. 11, *d*) steep, flattened; interspace 2 weakly impressed, punctures of striae 1, 2, and 3 much larger than on disc, with surface of each puncture coarsely reticulate; interstrial punctures minutely granulate, with a few larger tubercles in more definite positions; two of these larger tubercles occur on lower half of interspace 1, one toward apex of 2, about six distributed on 3, about five on 4, and several smaller ones scattered over posterolateral margin. Vestiture consisting of rows of small strial hair; and rows of fine, long, erect, rather abundant, interstrial hair; somewhat longer on declivity.

Male: Not represented in material at hand.

DISTRIBUTION: Malaya, Java, Borneo, Philippine, New Guinea, and Caroline Is.

PALAU. BABELTHUAP: One, Ngaremeskang, Feb. 1938, Esaki; one, 30 m., Dec. 1952, Gressitt. PELELIU: One, July 1945, Dybas.

PONAPE. One, Mt. Beirut (Pairot), 300-600 m., Mar. 1948, Dybas; one, Mt. Temwetemwensekir, 180 m., Jan. 1953, Gressitt.

This species is readily distinguished from other Micronesian representatives of the genus by the comparatively dense pubescence, by the rounded posterolateral margin of the declivity, by the expanded declivital punctures, with the surface within each puncture coarsely reticulate, by the rather slender pronotum, and by the distinctive declivital armature.

The Micronesian specimens agree in all details with material in Eggers' collection in the U. S. National Museum.

50. Xyleborus indicus Eichhoff (fig. 12, *a, b*).

Xyleborus indicus Eichhoff, 1878 (1879), Soc. Roy. Sci. Liége, Mém. II, **8**: 354.—Beeson, 1930, Indian Forest Rec. **14**: 63.

Xyleborus samoensis Beeson, 1929, Insects of Samoa **4** (4): 237 (n. syn.).—Schedl, 1951, B. P. Bishop Mus., Occ. Papers **20** (10): 137.

Female: Length 2.3-2.4 mm., 2.8 times as long as wide; color very dark brown.

Frons convex, with a small transverse elevation immediately above epistoma and a median subcarinate elevation in impressed area; surface reticulate, with a few indefinite, coarse punctures; vestiture inconspicuous. Eye about half divided by an emargination; finely granulate.

Pronotum 1.2 times as long as wide; widest in front of middle, subquadrate, sides and anterior margin rather weakly arcuate; summit indefinite, near center; anterior declivous area finely asperate, reticulate and sparsely, minutely punctate behind; vestiture inconspicuous.

Elytra 1.7 times as long as wide, 1.5 times as long as pronotum; sides straight and subparallel on basal two-thirds, rather broadly rounded behind; striae 1 and 2 usually feebly impressed, punctures moderately large and deep; interstriae wider than striae, smooth and impunctate, except rarely with one or two punctures. Declivity (fig. 12, *b*) rather steep, flattened below; lateral margin carinate from interspace 7 to elytral apex; sutural interspace usually somewhat elevated; interstriae each with a row of fine granules, those on interspace 3 usually very slightly larger. Vestiture consisting of rows of interstrial hair, each hair arising from interstrial puncture or granule; largely confined to declivity.

Male: Not represented in material at hand.

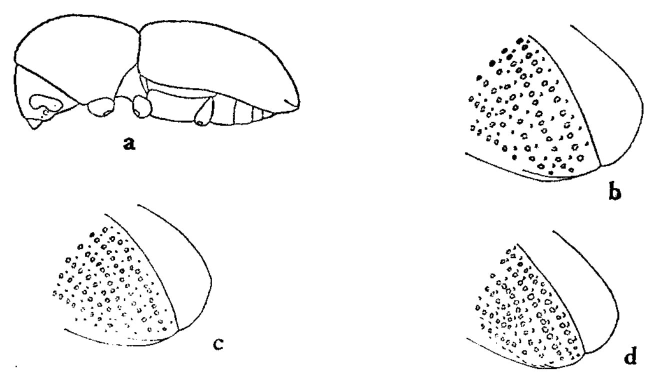


FIGURE 12.—**a, b,** *Xyleborus indicus,* female: *a,* lateral view; *b,* posterolateral view, declivity. **c,** *X. laevis,* posterolateral view, female declivity. **d,** *X. kororensis,* posterolateral view, female declivity.

DISTRIBUTION: Africa, southern Asia to Australia, Philippine, New Guinea, Samoan, and Caroline Is.

TRUK. WENA: One, under bark of breadfruit, Feb. 1948, Dybas.

PONAPE. One, Awakpah, Uh District, under bark of breadfruit, Mar. 1948, Dybas.

This species is distinguished from other Micronesian representatives of the genus by the rather slender, subquadrate pronotum with an unarmed anterior margin, by the absence of interstrial punctures on the anterior half of the elytral disc, by the sharply carinate posterolateral margin of the declivity, and by the presence of a row of fine granules on each declivital interspace.

In addition to the Micronesian specimens, two specimens from the Samoan Islands and three specimens from the Belgian Congo were examined. The two

Samoan specimens, one of those from the Belgian Congo, and the one from Truk conform exactly to Beeson's *Xyleborus samoensis*; one specimen from the Belgian Congo conforms exactly to Beeson's concept of *X. indicus* [1929, Insects of Samoa **4** (4) : 238]; and the third specimen from the Belgian Congo and the Ponape specimen are intermediate between the extremes. Since the differences between the two forms are only minor and because the extremes and an intermediate between the extremes all occur in the single series from the Belgian Congo, it is evident that only one species is represented.

51. Xyleborus laevis Eggers (fig. 12, *c*).

Xyleborus laevis Eggers, 1923, Zool. Meded. Roy. Mus. Nat. Hist. Leyden **7**: 201.—Schedl, 1942, Tijdschr. Ent. **85**: 48.

Female: Length 1.6-1.7 mm., 3.0 times as long as wide; color light brown.

Frons convex, surface reticulate and sparsely, obscurely punctured. Eye about half divided by an emargination; finely granulate.

Pronotum 1.2 times as long as wide; sides straight and subparallel on basal half, rather broadly rounded in front; anterior margin unarmed; summit just in front of middle; anterior declivous area finely asperate, minutely subreticulate and very finely punctured behind; vestiture inconspicuous.

Elytra 1.8 times as long as wide; 1.6 times as long as pronotum; sides straight and subparallel on basal two-thirds, broadly rounded behind; striae not impressed, punctures rather large, moderately deep; interstriae wider than striae, punctures minute, quite regular. Declivity (fig. 12, *c*) rather steep, convex, rather broad; posterolateral margin carinate from interspace 7 to elytral apex; interstriae very feebly convex near center of declivity, almost flat above and below; interstrial punctures replaced by fine granules. Vestiture sparse, apparently confined to declivity, consisting of rows of very minute strial hair and rows of small, but slightly longer, interstrial hair.

Male: Not represented in material at hand.

DISTRIBUTION: Malaya to New Guinea, Philippine, and Caroline Is.

PONAPE. Two, Awakpah, Uh District, under bark of breadfruit, Mar. 1948, Dybas; one, Mt. Nahnalaud, 600 m., Mar. 1948, Dybas; two, Mt. Temwetemwensekir, Mar. 1948, Dybas; one, Mt. Dolen Kiepw (Tolenkiup), 700 m., June-Sept. 1950, Adams; one, Colonia-Sankakuyama, Apr. 1939, Esaki; one, Nanipil, Net District, Feb. 1948, Dybas; one, Dolotomw (Tolotom), 530 m., June-Sept. 1950, Adams.

KUSAIE. Four, Mutunlik, Jan. 1953, Gressitt.

This species is rather closely allied to *Xyleborus indicus,* but is readily distinguished by the more strongly rounded anterior margin of the pronotum, by the regularly punctured elytral interspaces, and by the smaller size.

52. Xyleborus kororensis Wood, n. sp. (fig. 12, *d*).

Female: Length 1.9 mm., 3.0 times as long as wide; color light brown.

Frons convex, with a small transverse impression just above epistoma, surface reticulate and very sparsely, obscurely punctured; vestiture inconspicuous except along epistomal margin. Eye about half divided by an emargination, finely granulate.

Pronotum 1.2 times as long as wide; widest at middle, sides straight on posterior half, rather narrowly rounded in front; anterior margin unarmed; summit in front of middle; anterior declivous area finely asperate; posterior area with minutely subreticulate and

smooth shining areas more or less intermixed, and with minute, sparse punctures; vestiture inconspicuous.

Elytra 1.8 times as long as wide, 1.5 times as long as pronotum; sides straight and subparallel on basal two-thirds, broadly rounded behind; striae not impressed, punctures rather large, moderately deep; interstriae wider than striae, punctures minute, quite regular. Declivity (fig. 12, *d*) rather steep, weakly convex; rather broad; posterolateral margin carinate from interspace 7 to elytral apex; striae impressed, punctures more or less confluent; interstriae convex, 1, 2, 3, and 4 continue to elevated margin, 4 partly reduced; interstriae 5 and 6 end before reaching elevated margin; interstrial armature consisting of small, pointed, rather close granules. Vestiture largely abraded, evidently similar to that of *laevis*.

Male: Not represented in material at hand.

Holotype, female (US 64631), Koror, Palau Is., beating vegetation on limestone ridge south of inlet, Jan. 21, 1948, Dybas. Paratypes, eight females (US, CM, BISHOP, CNC), same data as for holotype.

DISTRIBUTION: Caroline Is. (Palau).

This species is more closely allied to *Xyleborus laevis* than to other known species; it may be distinguished by the more deeply impressed declivital striae, with at least partly confluent punctures, by the more strongly elevated declivital interspaces, and by the coarser declivital armature.

53. **Xyleborus ferrugineus** (Fabricius). (Figure 13, *a*.)

Bostrichus ferrugineus Fabricius, 1801, Syst. Eleuth. **2**: 388.

Xyleborus fuscatus Eichhoff, 1867, Berliner Ent. Zeitschr. **11**: 400 (n. syn.); 1878 (1879), Soc. Roy. Sci. Liége, Mém. II, **8**: 386.—Hopkins, 1915, U. S. Dept. Agric., Rept. **99**: 67.—Blackman, 1922, Mississippi Agric. Expt. Sta., Tech. Bull. **11**: 118.

Xyleborus confusus Eichhoff, 1867, Berliner Ent. Zeitschr. **11**: 401 (n. syn.); 1878 (1879), Soc. Roy. Sci. Liége, Mém. II, **8**: 384.—Blackman, 1922, Mississippi Agric. Expt. Sta., Tech. Bull. **11**: 119.—Beeson, 1929, Insects of Samoa **4** (4): 245.—Schedl, 1942, B. P. Bishop Mus., Bull. **172**: 149.

Xyleborus insularis Sharp, 1885, Roy. Dublin Soc., Trans. **3** (2): 193.

Xyleborus ferrugineus, Eggers, 1929, Wiener Ent. Zeitung **46**: 47.

Female: Length 2.3-2.7 mm., 2.8 times as long as wide; color reddish brown.

Frons convex, usually with an indefinite prominence between eyes; surface reticulate and sparsely punctured; vestiture inconspicuous except along epistoma. Eye more than one-third divided by an emargination; rather coarsely granulate.

Pronotum 1.2 times as long as wide; sides almost straight and subparallel on more than basal half, rather broadly rounded in front; anterior margin unarmed; summit just in front of middle; anterior declivous area finely asperate; posterior area minutely punctured, smooth and shining on disc, rather obscurely reticulate at sides; vestiture inconspicuous.

Elytra 1.7 times as long as wide; 1.4 times as long as pronotum, sides almost straight and subparallel on basal two-thirds, very broadly rounded behind; striae not impressed, punctures rather small and of moderate depth; interstriae smooth and shining, wider than striae; interstriae 1 and 2 usually punctured to base, 3 only on posterior half of disc, 4 only near declivity, punctures may be rather large and setiferous, or minute and without setae, or a mixture of the two types. Declivity (fig. 13, *a*) rather steep, flat; lateral margin

sharply elevated from interspace 7 to elytral apex; strial punctures very shallow; interstriae 2 weakly impressed, usually with one or two small tubercles at declivital base; interspace 1 slightly elevated and bearing two pairs of small tubercles near declivital base and one similar pair on lower half of declivity; interspace 3 bearing a pair of small tubercles near declivital base, a similar pair near lower margin, and a much larger prominent pair at center of declivity; interspaces 4, 5, and 6 usually bearing two or three pair of small tubercles on upper half of declivity. Vestiture largely confined to declivity, consisting of semidefinite sparse rows of erect interstrial hair.

Male: Not represented in material at hand.

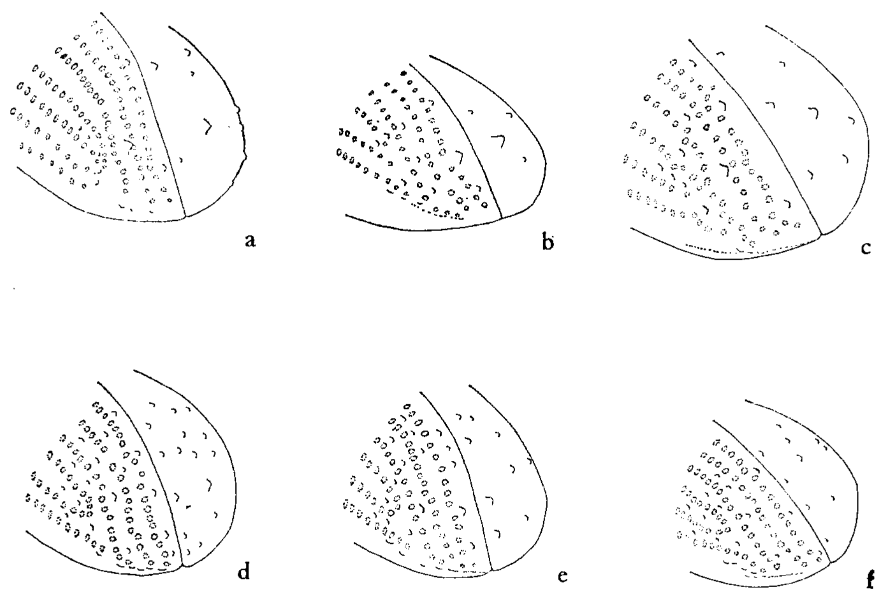


FIGURE 13.—*Xyleborus* spp., posterolateral view, female declivity: **a**, *ferrugineus;* **b**, *similis;* **c**, *buxtoni;* **d**, *volvulus;* **e**, *perforans;* **f**, *affinis.*

DISTRIBUTION: Virtually all tropical and subtropical parts of the world.

S. MARIANA IS. ROTA: Two, Oct. 1945, Necker. GUAM: One, Agana, Apr. 1946, Krauss; one, Pt. Oca, Mar. 1945, R. Bohart; six, Yigo, Oct. 1936, Swezey.

PALAU. BABELTHUAP: One, Ngatpang, 65 m., light trap, Dec. 1952, Gressitt; one, Ngaremeskang, 25 m., light trap, Dec. 1952, Gressitt.

TRUK. FEFAN: One, Mesa-Urunna, Nov. 1937, Esaki. WENA: One, under bark of breadfruit, Feb. 1948, Dybas.

PONAPE. Two, Colonia, Aug. 1946, Townes; one, Madolenihm (Matalanim) Plantation, June-Sept. 1950, Adams.

KUSAIE. Two, Mutunlik, 22 m., at light, Mar. 1953, Clarke.

GILBERT IS. TARAWA: Three, Bairiki I., Nov. 1957, Krauss.

This cosmopolitan species is readily distinguished from other Micronesian representatives of the genus by the rather slender pronotum with an unarmed anterior margin, by the presence of a pair of rather large tubercles on interstriae 3 near the center of the declivity, and by the reduced number of punctures on the discal interstriae of the elytra.

This species evidently has been introduced into the South Pacific islands in relatively recent times. It has a wide variety of hosts, but when collected it is usually taken at light. It was described by Fabricius in 1801, but remained unknown to active workers until Eggers (1929, loc. cit.) studied the type. After examining the type specimen, Eggers concluded that it represented a distinct species closely allied to *Xyleborus confusus,* and he compared it to that species. The differences he found were: Smaller size (2.2 mm.), more slender form, sparsely punctured interstriae, posterolateral margin of the declivity more distinctly raised, the prominent tubercle on declivital interspace 3 smaller and pointed, and the striae less distinctly impressed. In each of several series examined, including material from Micronesia, the Hawaiian Islands, Mexico, United States, South America, and Africa, examples of both forms were found in material collected on the same day from the same host by the same collector. All of the minor differences between *X. confusus* and *X. ferrugineus* listed by Eggers were found to vary within a series independent of size, punctation of the interspaces, or other characters. The character usually given to separate *X. confusus* from *X. fuscatus* has been the impunctate discal interstriae; however, fewer than ten percent of the several hundred neotropical specimens examined were actually impunctate; occasional nearctic specimens also have impunctate elytral interstriae. In the absence of consistent distributional, morphological, or biological evidence, it is apparent that only one species is represented by the three names. Since *X. ferrugineus* has priority, it should be used to designate the species.

54. Xyleborus similis Ferrari (fig. 13, *b*).

Xyleborus similis Ferrari, 1867, Die Forst-und Baumzuchtschädlichen Borkenkäfer, 24.—Eggers, 1929, Wiener Ent. Zeitung **46**: 48.—Schedl, 1942, B. P. Bishop Mus., Bull. **172**: 149; 1942, Tijdschr. Ent. **85**: 47.

Female: Length 2.3-2.5 mm., 2.7 times as long as wide; color reddish brown.

Frons convex, usually with an indefinite prominence between eyes; surface reticulate and sparsely punctured; vestiture inconspicuous except along epistoma. Eye more than one-third divided by an emargination; rather coarsely granulate.

Pronotum 1.1 times as long as wide, appearing almost subquadrate, sides almost straight and subparallel on more than basal half, very broadly rounded in front; anterior margin unarmed; summit at middle; anterior declivous area finely asperate; posterior area minutely punctured, smooth and shining on disc, rather obscurely reticulate at sides; vestiture inconspicuous.

Elytra 1.6 times as long as wide, 1.5 times as long as pronotum; sides almost straight and subparallel on basal two-thirds, rather broadly rounded behind; striae not impressed,

punctures small, of moderate depth; interstriae smooth and shining, wider than striae, punctures rather small, deep, and regular. Declivity (fig. 13, *b*) rather steep, flattened, opalescent, with a pair of prominent tubercles just below center on interspace 1; postero-lateral margin sharply elevated from interspace 7 to elytral apex; sutural striae diverging conspicuously from suture in order to pass lateral to prominent tubercle on interspace 1, striae 2 and 3 also diverging somewhat; interspace 1 with additional small tubercle near declivital base and another small tubercle near apex, interspaces 2 to 5 usually bearing one to three similar fine tubercles on upper half of declivity. Vestiture consisting of rows of erect interstrial hair, somewhat coarser on declivity.

Male: Not represented in material at hand.

DISTRIBUTION: Malaya to Australia and the Philippine, Hawaiian, and Caroline Is.

S. MARIANA IS. SAIPAN: Two, Nov. 1941, Matusita. AGIGUAN: Four, June 1952, Kondo. GUAM: One, June 1945, Stuntz; seven, Pt. Oca, light trap, June 1945, G. Bohart and Gressitt.

PALAU. BABELTHUAP: One, Ngerehelong, at light, Dec. 1947, Dybas; two, Ngiwal, Dec. 1952, Gressitt; one, Ngiwal, Aug. 1951, Gressitt. KOROR: Three, Dec. 1947, Dybas; one, at light, Mar. 1953, Beardsley. NGERGOI: One, Aug. 1945, Hagen. PELELIU: Eleven, July 1945, Hagen; 44, at light, July, Aug. 1945, Dybas; Jan. 1948, Dybas. ANGAUR: Six, Aug. 1945, Dybas; one, Feb. 1948, Dybas; one, July 1951, Gressitt.

CAROLINE ATOLLS. KAPINGAMARANGI: One, Matiro (Machiro) I., Aug. 1946, Townes; two, Werua (Ueru), Aug. 1946, Oakley. NUKUORO: One, Shenukdei I., Aug. 1946, Oakley.

TRUK. WENA: One, Feb. 1948, Dybas. TON: One, Mt. Unibot, Berlese sample, Jan. 1953, Gressitt.

PONAPE. Two, Sokehs (Jokaj), Feb. 1948, Dybas; one, Nanipil-Sankakuyama, Jan. 1938, Esaki; one, Nanpohnmal, 70 m., light trap, Jan. 1953, Gressitt; one, Nanwei, June-Sept. 1950, Adams.

KUSAIE. One, Tafeayat, 1 m., under dead bark, Feb. 1953, Clarke.

MARSHALL IS. AILINGLAPALAP: One, Bikajela I., Nov. 1948, Langford. ARNO: One, Bikarej I., July 1950, La Rivers; two, Ine I., July 1950, La Rivers. WOTJE: One, Wotje I., Nov. 1948, Langford.

This species is readily distinguished from other Micronesian representatives of the genus by the rather slender pronotum, with the unarmed anterior margin, and by the sutural striae conspicuously diverging from the suture in order to pass lateral to the second and largest of three declivital tubercles on interspace 1 (fig. 13, *b*).

55. Xyleborus buxtoni Beeson (fig. 13, *c*).

Xyleborus buxtoni Beeson, 1929, Insects of Samoa **4** (4): 243.

Female: Length 2.9-3.1 mm., 2.7 times as long as wide; color reddish brown, usually with declivity black.

Frons convex, usually with indefinite prominence between eyes; surface reticulate and sparsely punctured; vestiture inconspicuous except along epistoma. Eye more than one-third divided by an emargination; rather coarsely granulate.

Pronotum 1.14 times as long as wide; sides almost straight and subparallel on more than basal half, rather broadly rounded in front; anterior margin unarmed; summit just in front of middle; anterior declivous area rather coarsely asperate; posterior area finely punctured, smooth and shining on disc, rather obscurely reticulate at sides; vestiture inconspicuous.

Elytra 1.8 times as long as wide, 1.6 times as long as pronotum; sides almost straight and subparallel on basal two-thirds, rather broadly rounded behind; striae not impressed, punctures small and shallow; interstriae smooth and shining; wider than striae, punctures rather fine, finely granulate, somewhat more widely spaced than those of striae. Declivity (fig. 13, *c*) rather steep, flattened but feebly convex; interspace 1 with a rather coarse tubercle near center of upper half and one near center of lower half; interspace 3 with a coarse tubercle at center of declivity; interspace 1 occasionally with one or two additional fine tubercles, 3 usually with a small tubercle near upper margin and another near lower margin of declivity, 4, 5, and 6 also usually with one or two small tubercles on upper half. Vestiture consisting of rows of erect interstrial hair, somewhat longer on declivity.

Male: Not represented in material at hand.

DISTRIBUTION: Samoan and Caroline Is.

PALAU. PELELIU: One, Aug. 1945, Dybas; two, Aug. 1945, Hagen.

KUSAIE. Four, Mutunlik, 22 m., Jan.-Mar. 1953, Clarke; 48, Pukusrik, 1 m., mangrove, light trap, Apr. 1953, Clarke.

This species is distinguished from other Micronesian representatives of the genus by the rather slender pronotum, with the unarmed anterior margin, by the presence of at least some subtuberculate punctures on the elytral disc, by the absence of tubercles on declivital interstriae 2, and by the relatively large size. The declivity is very similar to that of *X. ferrugineus* in respect to the number and position of the tubercles; however, there are about three pair of large tubercles of about equal size, all proportionately smaller than the single pair of large tubercles in *X. ferrugineus.*

It is entirely possible that this species is a synonym of *Xyleborus cognatus* Blandford. Unfortunately, only one authentic specimen of *X. cognatus* was available for comparison with the Micronesian material. This specimen was slightly smaller and exhibited minute differences in declivital sculpture; perhaps it is only a normal variation of the species, but longer series should be compared before Beeson's name is placed in synonymy.

56. Xyleborus volvulus (Fabricius). (Figure 13, *d.*)

Bostrichus volvulus Fabricius, 1775, Syst. Ent. **4**: 454.

Hylesinus volvulus, Fabricius, 1801, Syst. Eleuth. **2**: 394.

Xyleborus alternans, Eichhoff, 1868, Berliner Ent. Zeitschr. **12**: 280; 1878 (1879), Soc. Roy. Sci. Liége, Mém. II, **8**: 368.

Xyleborus volvulus, Eggers, 1929, Wiener Ent. Zeitung **46**: 47.

Female: Length 2.4-2.6 mm., 2.7 times as long as wide; color very dark reddish brown, posterior half of the pronotum somewhat lighter.

Frons convex, usually with an indefinite prominence between eyes; surface reticulate and sparsely punctured; vestiture inconspicuous except along epistoma. Eye more than one-third divided by an emargination; rather coarsely granulate.

Pronotum 1.14 times as long as wide; sides feebly arcuate, almost subparallel on more than basal half, broadly rounded in front; anterior margin unarmed; summit just in front of middle; anterior declivous area rather finely asperate; posterior area finely punctured, smooth and shining on disc, rather obscurely reticulate at sides; vestiture rather inconspicuous.

Elytra 1.6 times as long as wide, 1.4 times as long as pronotum; sides almost straight and subparallel on basal two-thirds, rather broadly rounded behind; striae feebly impressed, particularly 1, punctures rather small, moderately deep; interstriae smooth and shining, wider than striae, punctures not deep, rather irregular in size, more widely spaced than those of striae. Declivity (fig. 13, *d*) steep, convex; sharply elevated portion of lateral margin short; interstriae 1 and 3 with three to about five rather small tubercles, on each interspace the two nearest center usually somewhat larger; interstriae 2 usually devoid of granules, or with one or two very fine ones near upper and lower declivital margins; interstriae 4, 5, and 6 usually with one to three small tubercles toward upper half of declivity. Vestiture consisting of rows of minute strial hair, at least on declivity; and rows of rather long, erect interstrial hair, in most specimens those on declivity appearing coarse and more or less flattened.

Male: Not represented in material at hand.

DISTRIBUTION: Evidently found in most of the tropical and subtropical parts of the world.

PALAU. KOROR: One, Feb. 1953, Beardsley; four, July 1956, McDaniels.

TRUK. TON: One, Netutu, Apr. 1949, Potts.

This species is separated with difficulty from *X. perforans* and *X. affinis*; these three are distinguished from other Micronesian representatives of the group by the rather slender pronotum, by the unarmed anterior margin, by the absence of tubercles on declivital interstriae 2 and the discal interstriae, and by the size. This species is separated from *X. perforans* and *X. affinis* by the larger size, by the weakly impressed discal striae, by the steeper, more strongly convex elytral declivity, and by the darker color.

Three specimens in the Canadian National Collection, labelled *Xyleborus alternans,* presumably examined by Eichhoff, a series from Baja California labelled *X. volvulus* by Schedl and another from the same area labelled *X. torquatus* by Schedl, two series from Africa labelled *X. badius,* one by Schedl and one by Eggers, the two Micronesian specimens, and several series from Mexico and South America all represent one species. Eggers has already placed *X. alternans* in synonymy under *X. volvulus.* Since only one morphological species can be found in the abundant neotropical material now available, or in collections from other parts of the world, and in the absence of biological or other indications that more than one species is represented, it may become necessary for the names *X. torquatus* and *X. badius* also to be considered as synonyms of the older name *X. volvulus.*

57. Xyleborus perforans (Wollaston). (Figure 13, *e*).

Tomicus perforans Wollaston, 1857, Cat. Coleopt. Madeira Brit. Mus., 96.

Xyleborus testaceus Walker, 1859, Ann. Mag. Nat. Hist. III, **3**: 260.—Schedl, 1942, B. P. Bishop Mus., Bull. **172**: 148; 1950, B. P. Bishop Mus., Occ. Papers **20** (3): 40; 1951, B. P. Bishop Mus., Occ. Papers **20** (10): 141.

Xyleborus kraatzi Eichhoff, 1868, Berliner Ent. Zeitschr. **12**: 152.—Beeson, 1929, Insects of Samoa **4** (4): 240; 1940, B. P. Bishop Mus., Occ. Papers **15** (18): 198.

Xyleborus perforans, Browne, 1955, Sarawak Mus. Jour. **6**: 355.

Female: Length 2.0-2.5 mm., 2.8 times as long as wide; color yellowish brown.

Frons convex, usually with an indefinite prominence between eyes; surface reticulate and sparsely punctured; vestiture inconspicuous except along epistoma. Eye more than one-third divided by an emargination; rather coarsely granulate.

Pronotum 1.17 times as long as wide; sides almost straight and subparallel on more than basal half, rather broadly rounded in front; anterior margin unarmed; summit just in front of middle; anterior declivous area rather finely asperate; posterior area finely punctured, smooth and shining on disc, rather obscurely reticulate at sides; vestiture rather inconspicuous.

Elytra 1.7 times as long as wide, 1.5 times as long as pronotum; sides almost straight and subparallel on basal two-thirds, rather broadly rounded behind; striae not at all impressed, punctures rather small, not deep; interstriae smooth and shining, wider than striae, punctures rather small, not regular or close. Declivity (fig. 13, *e*) rather steep, moderately convex; sharply elevated portion of lateral margin short; interstriae 1 and 3 each with two or three rather coarse, pointed tubercles, and usually with two or three smaller ones toward declivital base, more rarely on lower half; interstriae 2 unarmed; interstriae 4, 5, and 6 usually with one to three rather small tubercles on upper half of declivity. Vestiture consisting of rows of minute strial hair, at least on declivity; and rows of rather long, erect interstrial hair; usually somewhat coarser on declivity.

Male: Similar to female except smaller, about 2.0 mm.; eye reduced in size to about one-half that of the female; and anterior margin of the pronotum obtusely angulate, not rounded.

DISTRIBUTION: Reported from virtually all tropical and subtropical areas of the world.

BONIN IS. CHICHI JIMA: One, Omura, May 1958, Snyder. HAHA JIMA: Two, Apr. 1958, Snyder.

S. MARIANA IS. SAIPAN: Nov. 1944, Hagen; Nov. 1944, Edgar; Dec. 1944, Jan., Feb. 1945, Dybas; June 1945, Ducoff; As Lito-I Madang area, Dec. 1944, Dybas; As Mahetog area, Nov. 1944, Jan.-Mar., May 1945, Dybas; Halaihai-As Teo area, Jan. 1945, Dybas; hills east of Garapan, Jan. 1945, Dybas; Mt. Tagpochau, Nov. 1944, Edgar; Jan., Feb., Apr. 1945, Dybas; Garapan, Feb. 1936, Esaki; Garapan, May 1940, Yasumatsu and Yoshimura. TINIAN: Tinian Harbor, Mar. 1945, Dybas. AGIGUAN: May 1952, Kondo. ROTA: Oct. 1945, Necker; June 1952, Kondo; Songsong Isthmus, Oct. 1945, Necker; Songsong, Feb. 1936, Esaki. GUAM: 1923, Hornbostel; June 1945, Stuntz; Agana, Nov. 1952, Gressitt; Agana Airport, Aug. 1945, Dybas; Agana

Spring, May 1945, Gressitt; Sinajana-Barrigada, Dec. 1952, Gressitt; Pt. Oca, light trap, June 1945, G. Bohart and Gressitt.

PALAU. BABELTHUAP: Ngatpang, 65 m., at light, Dec. 1952, Gressitt; Ngiwal, Aug., Sept. 1951, Gressitt; Ulimang, Dec. 1947, Jan. 1948, Dybas; Ngardok Colony, Feb. 1938, Esaki; Ngiwal, Aug. 1939, Esaki. NGERGOI: Aug. 1945, Hagen; Aug. 1945, Dybas. KOROR: Aug., Apr. 1952, Beardsley; Sept., Dec. 1947, Jan. 1948, Dybas; Nov. 1951, Dec. 1952, Gressitt; Feb. 1938, Murakami. PELELIU: North central, July-Aug. 1945, Dybas; east coast, Aug. 1945, Dybas; at light, July 1945, Hagen; Aug. 1948, Baker. ANGAUR: Feb. 1948, Dybas; July 1951, Gressitt.

YAP. YAP: July-Aug. 1950, Goss; Aug. 1952, Krauss; hill behind Kolonia, 50 m., Dec. 1952, Gressitt; Ruul District, Sept. 1939, Esaki. GAGIL-TOMIL: Tomil District, Sept. 1939, Esaki.

CAROLINE ATOLLS. TOBI: Jan. 1938, Murakami. IFALUK: Aug., Oct. 1953, Bates.

TRUK. TON: Mt. Unibot, at light, Jan. 1953, Gressitt; Netutu, Apr. 1949, Potts. WENA: Under bark of breadfruit, Feb. 1948, Dybas; June 1946, Townes; Mt. Chukumong, Dec. 1952, Gressitt. TONOAS: Dec. 1935, Ono.

PONAPE. Awakpah, Uh District, breadfruit, Mar. 1948, Colonia, Feb. 1948, Dybas; Colonia, Aug. 1946, Townes; Madolenihm (Matalanim) Plantation, June-Sept. 1950, Adams; Mt. Kupwuriso, 600 m., Mar. 1948, Dybas; Mt. Temwetemwensekir, 180 m., light trap, Jan. 1953, Gressitt; Nanpohnmal, 70 m., light trap, Jan. 1953, Gressitt; Colonia, July 1939, Nihpit, July 1939, Ronkiti, Jan. 1938, all Esaki.

KUSAIE. Malem, Dec. 1937, Esaki; Hill 541, 165 m., Mar. 1953, Clarke; Hill 1010, 300 m., Apr. 1953, Clarke; Innem River, 60 m., Jan. 1953, Clarke; Malem River, 30 m., Mar. 1953, Clarke; Mutunlik, 22 m., Jan.-Mar. 1953, Clarke; Wakapp, 30 m., at light, Apr. 1953, Clarke.

MARSHALL IS. ARNO: Bikarej I., breadfruit, July 1950, La Rivers; Ine I., June, Aug. 1950, La Rivers.

This species is distinguished from *Xyleborus affinis* by the brightly shining, shorter, more convex elytral declivity and by the coarser declivital tubercles.

More than 713 Micronesian specimens were examined. This has been the most commonly collected scolytid in the entire Pacific area.

58. Xyleborus affinis Eichhoff (fig. 13, *f*).

Xyleborus affinis Eichhoff, 1867, Berliner Ent. Zeitschr. **11**: 401.—Beeson, 1929, Insects of Samoa **4** (4): 245.

Xyleborus mascarensis Eichhoff, 1878 (1879), Soc. Roy. Sci. Liége, Mém. II, **8**: 372 (n. syn.).—Eggers, 1926, Treubia **7**: 301.—Schedl, 1940 (1939), An. Esc. Nac. Cienc. Biol. Mexico **1**: 365.—Beeson, 1940, B. P. Bishop Mus., Occ. Papers **15** (18): 199.—Schedl, 1951, B. P. Bishop Mus., Occ. Papers **20** (10): 140.

Female: Length 2.2-2.7 mm., 2.8 times as long as wide; color yellowish brown.

Frons convex, usually with indefinite prominence between eyes; surface reticulate and sparsely punctured; vestiture inconspicuous except along epistoma. Eye more than one-third divided by an emargination; rather coarsely granulate.

Pronotum 1.12 times as long as wide; sides feebly arcuate, almost subparallel on more than basal half, rather broadly rounded in front; anterior margin unarmed; summit just in front of middle; anterior declivous area rather finely asperate; posterior area finely punctured, smooth and shining on disc, rather obscurely reticulate at sides; vestiture rather inconspicuous.

Elytra 1.7 times as long as wide, 1.5 times as long as pronotum; sides almost straight and subparallel on basal two-thirds, somewhat narrowly rounded behind; striae not at all impressed, punctures rather small, not deep; interstriae smooth and shining, wider than striae, punctures small but irregular in size and spacing. Declivity (fig. 13, *f*) moderately steep, weakly convex; sharply elevated portion of lateral margin short; surface dull, opalescent; interstriae 1 and 3 each with about three to five small tubercles, usually two on each interspace somewhat larger than the others; interstriae 2 unarmed, or with one or two minute granules near declivital base; interstriae 4, 5, and 6 usually with one to three small tubercles on upper half of declivity. Vestiture consisting of rows of minute strial hair, at least on declivity; and rows of rather long, erect, interstrial hair; usually somewhat coarser and longer on declivity.

Male: Similar to the female except smaller, about 2.0 mm.; eye reduced in size to about one-half that of female; anterior declivous portion of pronotum impressed, subconcave, with anterior submargin more or less obtusely mucronate; body form somewhat stouter, and sculpture finer.

DISTRIBUTION: Reported from virtually all tropical and subtropical areas of the world.

PALAU. BABELTHUAP: Four, East Ngatpang, 65 m., Dec. 1952, Gressitt. KOROR: One, Apr. 1952, one, Mar. 1953, Beardsley.

YAP. YAP: Two, July-Aug. 1950, Goss.

TRUK. TON: Five, Mt. Unibot, light trap, Dec. 1952, Jan. 1953, Gressitt. WENA: One, 30 m., July 1946, Oakley.

PONAPE. One, Colonia, light trap, Jan. 1953, Gressitt; one, Mt. Temwetemwensekir, Jan. 1953, Gressitt; one, Colonia, Aug. 1932, Uchiyama.

KUSAIE. One, Hill 541, light trap, Apr. 1953, Clarke; three, Mt. Matante, at light, Mar. 1953, Clarke.

This species is distinguished, with some difficulty, from *X. perforans* by the dull, opalescent surface of the elytral declivity, by the smaller declivital tubercles, and by the longer, less strongly convex declivity.

Examination of more than a thousand specimens from the United States, several dozen from the West Indies and Mexico, and more than a dozen each from Peru, Brazil, Honduras, Hawaiian Islands, Micronesia, Indonesia, India, and Africa, as well as shorter series from other areas, indicated no justification for recognizing more than one species. The series from North America have formerly been designated by the name *Xyleborus affinis* because of a supposed larger size and minute difference in declivital sculpture; those from other areas were designated by the name *X. mascarensis*. The average length of all specimens from South America, Mexico, the Pacific islands, Indonesia, India,

Africa, the West Indies, and with a very few exceptions, the United States, was found to be 2.35 mm. Among the material from the United States was an exceptional series of 23 specimens from Mississippi that averaged 2.6 mm. in length; a few shorter series from the United States averaged about 2.5 mm., but the bulk of the material was not larger than that from other parts of the world. It should be noted also that occasional specimens, and even series, from Mexico, South America, Hawaiian Islands, and Africa were equally as large as the largest North American specimens. Obviously, size, average or otherwise, cannot be used as a character to separate this material into two distinct species. Since no two specimens exhibit identical declivital sculpture, and since the same irregularities appear to occur with equal frequency in all long series examined, it appears impossible to recognize two species. Since other species with related habits are now known to have distributions similar to that exhibited in this case, it is only logical that the name *X. mascarensis* must be withdrawn in favor of the older name *X. affinis*.